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Distribution and Abundance of Sardine and Anchovy Larvae in the California Current Region Off California and Baja California, 1951-64: A Summary

By Elbert H. Ahlstrom

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Distribution and Abundance of Sardine and Anchovy Larvae in the California Current Region off California and Baja California, 1951-64: A Summary

By

ELBERT H. AHLSTROM

Fishery Biologist (Supervisory)
Bureau of Commercial Fisheries California Current Resources Laboratory
La Jolla, Calif. 92037

ABSTRACT

Data summarized in this report document the nine-fold increase in the anchovy population (based on numbers of larvae) between 1951 and 1964, as well as the marked decline in the distribution and abundance of sardine larvae. Data for the years 1958-64 are treated in more detail than those for earlier years. Information was obtained on cooperative hydrographic-biological cruises of the California Cooperative Oceanic Fisheries Investigations.

INTRODUCTION

This report summarizes information about larvae of the Pacific sardine, Sardinops caerulea, and northern anchovy, Engraulis mordax, collected on survey cruises of the California Cooperative Oceanic Fisheries Investigations (CalCOFI), in 1951-64. These data record the spectacular increase in abundance of the larvae of anchovy and the decrease in numbers of those of sardine. The CalCOFI surveys began in 1949, but the surveys of 1949 and 1950 were less inclusive than those made subsequently; hence they are not strictly comparable. Data from these two years are not included.

The CalCOFI surveys during the decade of the 1950's covered the waters off California and Baja California, from Point St. George to below Cape San Lucas (station lines 40 to 157), a north-south extent of 1,400 miles (fig. 1). Seaward extension of lines was usually between 150 and 300 miles.

The pivotal station in laying out the CalCOFI grid pattern was one about 40 miles offshore from Point Conception, subsequently numbered 80.60. The coordinates of this station are lat. 34° 09'N. and long. 121° 09'W. A base line through this point, parallel to the general trend of the coastline, has a true bearing of 330°. This base line was used to derive the pivotal station line (line 80), which was oriented at right angles to it on a mercator projection. Station lines are parallel to each other and generally spaced 40 miles apart in the CalCOFI grid.

Within the area between Point St. George and Cape San Lucas are 36 station lines spaced 40 miles apart. These consist of cardinal lines (those whose numerical designations end in 0, as 40, 50...150) and ordinal lines (43, 47, 53, 57...153, 157). Numbers given to stations spaced along station lines increase seaward by the amount of one unit for each 4 miles of distance.

The key station on each line as regards numbering is station 60, which is located at the point where the base line (line drawn through pivotal station 80.60 with a true bearing of 330°) intersects the station line. In numbering a station, the line number is given first, followed by a period and the station number, as 80.60.

During the period of monthly cruises (1949-60), the numerical designation given to a cruise was a combination of the year and month, as 5101 for the January cruise of 1951. This simplicity of numbering was seldom possible during the period of quarterly cruises (1961-64), for the reason that most cruises required longer than one month to complete. The numbering of quarterly cruises takes cognizance of this; cruise 6101-02 was made in January and February of 1961, for example.

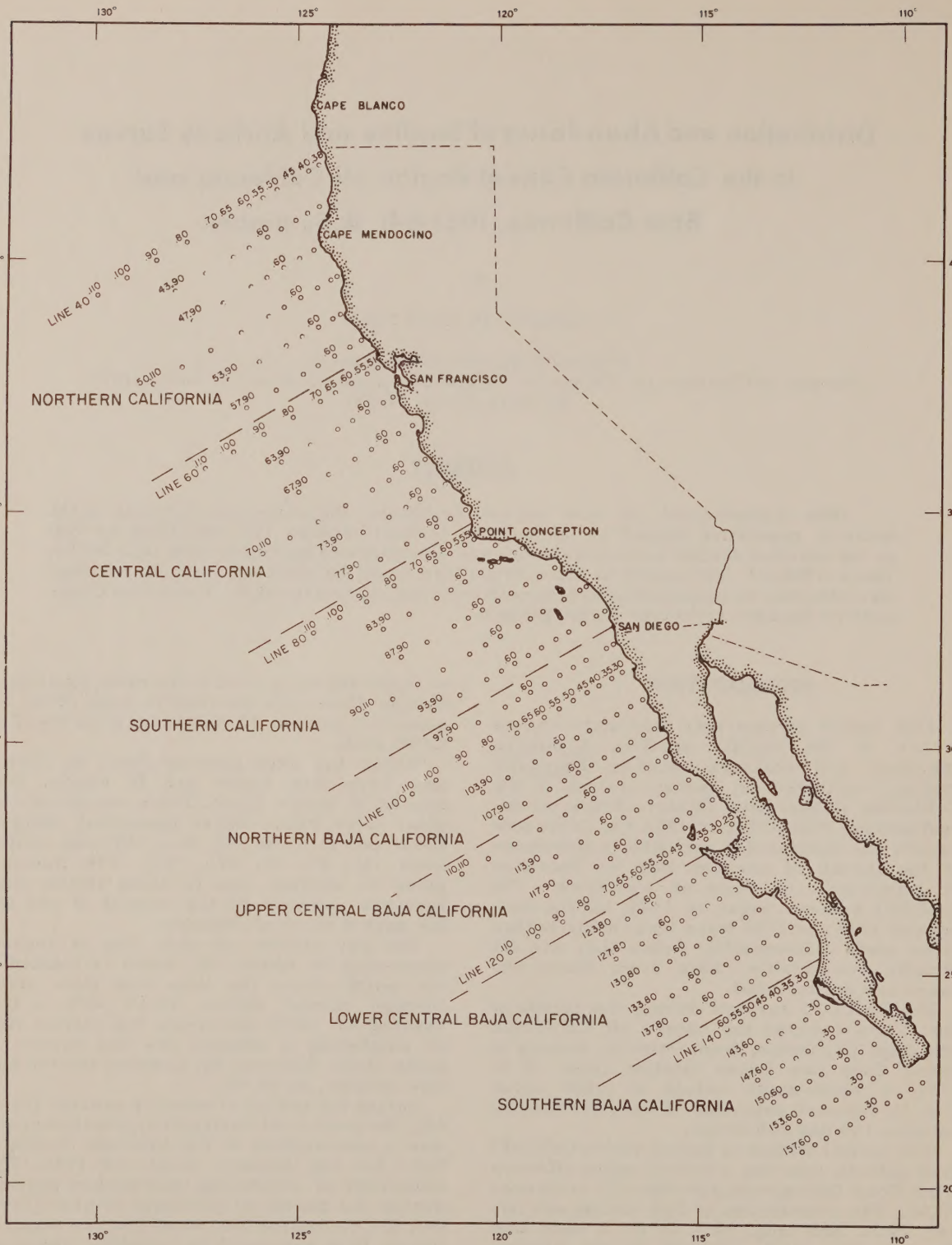


Figure 1.--Basic CalCOFI station pattern off California and Baja California (station lines 40–157); divisions into areas are indicated.

The area between Point St. George and Cape San Lucas usually is divided into subareas as follows:

Northern California	Station lines	40- 57
Central California	" "	60- 77
Southern California	" "	80- 93
Northern Baja California	" "	97-107
Upper central Baja California	" "	110-120
Lower central Baja California	" "	123-137
Southern Baja California	" "	140-157

For convenience, I am dropping the prefix and using the term "area" to designate these subdivisions of the CalCOFI area. They are illustrated in figure 1.

CalCOFI SURVEY CRUISES, 1951-60

During the decade, 1951-60, CalCOFI surveys were made at approximately monthly intervals. The majority of both anchovy and sardine larvae were collected during winter and spring; hence coverage on surveys has been most comprehensive during the first half of each year. The frequency of coverage of the several areas during 1951-60 is summarized in a two part table (table 1); the upper portion gives the number of coverages per year, and the lower the frequency of coverage by month.

CalCOFI cruises during these years totaled 114; in addition, agencies in CalCOFI participated in the wide-ranging cruise of August 1955 called "Norpac." Only 5 months during the decade were without any coverage within the CalCOFI survey area (December 1952, September 1954, November 1954, November 1960, and December 1960).

The areas most consistently occupied were the four lying between Point Conception and Point San Juanico (station lines 80-137). These areas contain the basic survey pattern; they are also the areas from which most sardine and anchovy larvae have been collected. Coverage was made off central California (lines 60-77) on over half of the cruises, but infrequently off northern California (lines 40-57). In fact, only 15 cruises extended into the latter area, usually during June and July. The southern Baja California area (lines 140-157) was covered on 29 cruises, most frequently during January through April.

Table 1. --Number of cruises occupying stations within various parts (areas) of the CalCOFI survey pattern off California and Baja California during the decade 1951-60

[Station lines given below each area]

Year	Northern California 40-57	Central California 60-77	Southern California 80-93	Northern Baja Calif. 97-107	Upper central Baja Calif. 110-120	Lower central Baja Calif. 123-137	Southern Baja Calif. 140-157	Total number of cruises
Frequency of coverage per year of areas within CalCOFI survey pattern, 1951-60								
1951	2	10	12	12	12	12	3	12
1952	2	8	11	11	11	11	1	11
1953	0	5	12	10	11	10	1	12
1954	1	9	10	10	10	10	2	10
1955 1/	0	4	11	9	9	9	4	11
1956	2	4	10	10	9	9	3	12
1957	0	4	9	10	10	10	5	12
1958	3	7	11	10	10	10	4	12
1959	2	10	12	9	10	10	3	12
1960	3	8	9	9	10	9	3	10
Total	15	69	107	100	102	100	29	114
Frequency of coverage summarized by month for areas within the CalCOFI survey pattern, 1951-60								
January	1	5	9	10	10	10	7	10
February	0	3	10	10	10	10	5	10
March	0	3	10	10	10	10	4	10
April	2	8	10	10	10	10	4	10
May	1	10	10	10	10	10	0	10
June	4	10	10	10	10	10	2	10
July	5	10	10	10	10	10	0	10
August 1/	1	5	6	6	9	9	3	9
September	0	2	6	2	8	6	1	9
October	1	7	10	10	9	9	1	10
November	0	4	8	5	2	2	0	8
December	0	2	8	7	4	4	2	8
Total	15	69	107	100	102	100	29	114

1/ Norpac cruise not included.

Coverage of the four areas between Point Conception and Point San Juanico was obtained consistently during the first 7 months of each year and also in October. During the other 4 months, coverage was sometimes comprehensive, but more often was limited to a portion of the range. When restricted, coverage was more frequent off central Baja California in August and September, and off southern California during November and December. Coverage off central California (lines 60-77) was achieved most consistently during April through July.

THE QUARTERLY SURVEY CRUISES OF 1961-64

Beginning in 1961 survey cruises were spaced at quarterly intervals. The pattern covered on most surveys was from line 60 to 140. The cardinal lines were covered on most cruises by a Scripps Institution of Oceanography vessel, either the Horizon or the Alexander Agassiz, and the ordinal lines by the Bureau of Commercial Fisheries vessel Black Douglas. Most cruises extended over 2 months.

Two cardinal lines, 60, off central California, and 90, off southern California, were extended seaward to station 200--an offshore distance of over 600 miles. Only lines 63, 67, 73, and 77 were abbreviated as compared with the usual coverage obtained on monthly survey cruises. Many station lines were extended farther seaward than was usual during monthly survey cruises.

METHODS OF SAMPLING

The plankton net employed since the beginning of CalCOFI surveys has been constructed of No. 30xxx grit gauze (heavy bolting silk). The shape of the net is cylindrical-conical; a forward cylindrical section, about 1 m. long, precedes the conical portion of the net, which is about 3 m. long. The net terminates in a detachable cod end. The net is 1.0 m. in diameter at the mouth (0.7854 $m.^2$); the ratio of mesh aperture area to mouth area is about 3:1.

Plankton hauls are made obliquely from about 140 m. to the surface, depth of water permitting. The net is lowered by paying out 200 m. of towing wire at a rate of 50 m. per minute. It is retrieved at a rate of 20 m. per minute, after allowing 0.5 minute for the net to come to equilibrium. Hence, a standard plankton haul requires 14.5 minutes. The haul is made at a vessel speed of about 1.5 to 2 knots. Vessel speed is carefully controlled to maintain the angle of the towing cable at 45°.

It has been established by attaching a depth-time recorder to the bridle of a net that there is a linear relation between the wire angle as measured at the surface and the depth of the net at any instant. Actual depth is the product of the amount of wire out times the cosine of the surface wire angle. The amount of water strained during a haul is about 500 $m.^3$.

LABORATORY PROCEDURES

CalCOFI surveys initially were oriented to the Pacific sardine, but from the inception of the cooperative cruises, eggs and larvae of all fishes taken in plankton hauls were separated and most were identified and counted. Larvae of the four species commonly grouped together as "wetfishes"--sardine, northern anchovy, Pacific mackerel (Scomber diego), and jack mackerel (Trachurus symmetricus)--have been counted by size; hence comparable information is available for all four species.

Plankton samples containing fish eggs and larvae are handled in three steps in our laboratory.

1. Each sample is examined, usually in its entirety, for fish eggs and larvae. Eggs and larvae of sardines and anchovies are separated from other fish eggs and larvae and counted. This initial count is designated as the "sorter's count."

2. The larvae of sardine and anchovies are measured to the nearest half-millimeter (standard length). The numbers derived from counts made on measured larvae constitute our accepted counts.

3. The larvae are grouped into the size categories used in our published records (mostly by 1.0 mm. length intervals), and these numbers are standardized to the number of larvae under 10 square meters of sea surface. This method of standardization makes hauls comparable to one another, and also permits meaningful integration of numbers of eggs or larvae over area.

This report deals primarily with the total standardized numbers of sardine and anchovy larvae in our survey collections. For the years 1951-59, we are including monthly summaries of size information for sardine and anchovy larvae. This information is derived from our published records for 1951-57 (Ahlstrom, 1953, 1954a, 1958, 1959a; Ahlstrom and Kramer 1955, 1956, 1957) and from a manuscript for the years 1958 and 1959. Similar information will be available soon for all collections obtained through 1964. Information about sardine and anchovy larvae collected on cruises in 1950 was published by Ahlstrom (1952). The 1949 data are unpublished for anchovy but were summarized for sardine by Ahlstrom (1954b).

In studies dealing with distribution and abundance of sardine and anchovy larvae, total numbers per haul are much simpler to use than are more detailed numbers by size. Most tables included in this report are based

on total numbers of larvae. The tables that are common to all years in this report summarize occurrence and abundance of larvae by cruise and area. I consider it important to include summaries for all years in the series, even though the basic data for 1951-57 have been published, and data for 1958 and 1959 will be soon. Copies of most of the earlier data reports are no longer available for distribution. It is also convenient to have the information assembled under one cover.

Beginning with 1958, numbers of sardine and anchovy larvae are listed by individual station. A combination of these tables and published reports contains individual station data for all years between 1951 and 1964.

The data in most tables are our final counts derived from measured larvae. For some cruises made in 1963 and 1964, final counts are not available for most stations. When larvae have not been measured (i.e., step 2 listed above has been omitted) the sorter's count has been standardized. Standardized sorters' counts are marked with asterisks.

DISTRIBUTION OF SARDINE EGGS AND LARVAE

The first aim of the CalCOFI surveys in 1949 was to delimit the distribution of sardine eggs and larvae both spatially and temporally. Considerable work had been done previously on the seasonal and areal occurrences of sardine eggs and larvae (Scofield, 1934; Ahlstrom, 1948). Spawning off southern California especially had been studied (Sette and Ahlstrom, 1948). Spawning was known to occur off central and northern California and even off Oregon (Scofield, 1934; Smith and Ahlstrom, 1948; Ahlstrom, 1948, 1954b). Although sardine eggs and larvae had been sampled off Baja California (Scofield, 1934; Tibby, 1937), neither their total distribution nor abundance was known. Evidence of the importance of the Baja California region for sardine spawning was obtained on a cruise off central Baja California in February 1948 (Ahlstrom, 1954b).

The CalCOFI surveys showed that sardine eggs and larvae were widely distributed between Point Conception and southern Baja California. In the early years of the surveys more sardine eggs and larvae were obtained off Baja California--especially off central Baja California--than off southern California. They occurred throughout the year in some areas (especially off central Baja California) and had a variable season of occurrence in other areas (especially off southern California). As a consequence, monthly survey cruises became the standard procedure of the CalCOFI survey program.

The CalCOFI surveys also showed that waters off central California (station lines 60-77) were an unimportant spawning area for sardines during the 1950's. Eggs or larvae were obtained infrequently, and numbers were negligible. There were 16 records of occurrence of sardine larvae off central California during 1951-64, 13 of which were concentrated in the period of warmer-than-average water temperatures in 1957-59 (table 2).

Cruises in the area north of San Francisco (station lines 40-57) have been infrequent--only 15 cruises since 1951. No sardine eggs or larvae were taken on any of these cruises.

The most marked change in distribution of sardine eggs and larvae during the period of

Table 2. --Sardine larvae--summary of occurrence and abundance by year and area, 1951-64

[Station lines given below each area]

Year	Central California 60-77 1/		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
Monthly cruises														
1951	1	2	23	310	26	758	55	4,088	56	5,795	8	115	169	11,068
1952	0	0	25	718	21	349	90	6,623	93	10,885	6	604	235	19,179
1953	0	0	3	15	8	56	98	9,453	84	4,629	7	247	200	14,400
1954	1	5	42	3,826	92	5,014	132	6,639	96	9,741	11	1,689	374	26,914
1955 2/	0	0	26	1,717	72	3,161	93	6,514	46	1,145	17	1,584	254	14,121
1956	0	0	22	1,548	39	1,163	61	8,291	38	3,063	11	1,458	171	15,523
1957	6	94	21	2,028	22	757	83	5,253	31	1,273	12	428	175	9,833
1958	2	19	71	2,014	26	555	53	6,581	30	1,561	13	697	195	11,427
1959	5	39	68	1,892	16	461	53	2,012	25	787	5	183	172	5,374
1960	0	0	38	715	26	170	41	3,216	18	2,227	10	1,684	133	8,012
Quarterly cruises														
1961	0	0	16	215	6	69	15	654	13	757	1	13	51	1,708
1962	0	0	9	150	6	99	22	1,091	21	918	0	0	58	2,258
1963	1	8	8	186	14	515	15	476	5	156	1	8	44	1,349
1964	0	0	2	15	3	70	13	298	16	2,312	3	62	37	2,757

1/ No sardine larvae taken on lines 40-57.

2/ Norpac cruise not included.

CalCOFI surveys occurred between 1953 and 1954. In 1953 less than 1 percent of the CalCOFI total of either sardine eggs or larvae was obtained off southern California and adjacent northern Baja California (station lines 80-107). In 1954, 38 percent of sardine eggs and 33 percent of sardine larvae were collected from these waters, and the distribution was the most widespread we have encountered (Ahlstrom, 1959b). Such marked changes in distribution point up the need for the extensive systematic coverage maintained by CalCOFI surveys through 1960. The percentage of sardine larvae taken in each area during 1951-64 is summarized in table 3.

The Gulf of California has a discrete population of sardines. Surveys made intermittently over several years in the Gulf have shown that sardines spawn throughout the Gulf in the winter and spring. The Gulf population appears to be a fairly large one, and genetic studies using blood antigens have shown that it is distinct from the stocks off Baja California and California.

The distribution and relative abundance of sardine larvae are illustrated for two years in figures 2 and 3. The widespread distribution of sardine larvae in 1954 is compared to the nearly as widespread distribution of anchovy larvae in that year (fig. 2). The restricted distribution of sardine larvae in 1962 is contrasted to the very widespread distribution of anchovy larvae in 1962 (fig. 3).

Table 3. --Sardine larvae--percentage of annual total taken in each area, 1951-64

[Station lines given below each area]

Year	Central California 60-77 1/	Southern California 80-93	Northern Baja California 97-107	Upper central Baja California 110-120	Lower central Baja California 123-137	Southern Baja California 140-153
Monthly cruises						
1951	0.02	2.80	6.85	36.94	52.36	1.04
1952	0	3.74	1.82	34.53	56.75	3.15
1953	0	0.10	0.39	65.65	32.15	1.72
1954	0.02	14.22	18.63	24.67	36.19	6.28
1955	0	12.16	22.39	46.13	8.11	11.22
1956	0	9.97	7.49	53.41	19.73	9.39
1957	0.96	20.62	7.70	53.42	12.95	4.35
1958	0.17	17.62	4.86	57.59	13.66	6.10
1959	0.73	35.21	8.58	37.44	14.64	3.41
1960	0	8.92	2.12	40.14	27.80	21.02
Quarterly cruises						
1961	0	12.59	4.04	38.29	44.32	0.76
1962	0	6.64	4.38	48.32	40.66	0
1963	0.59	13.79	38.18	35.28	11.56	0.59
1964	0	0.54	2.54	10.81	83.86	2.25

1/ No sardine larvae taken on lines 40-57.

DISTRIBUTION OF ANCHOVY LARVAE

Eggs and larvae of the northern anchovy have been identified and counted from all collections made by the California Current Resources Laboratory since it began ocean surveys in 1939. A record of anchovy larvae taken in plankton hauls made during the 1940 and 1941 surveys aboard the E. W. Scripps was given by Marr and Ahlstrom (1948).

Anchovy larvae, though superficially similar in appearance to larvae of the sardine (fig. 4), can be distinguished and have been routinely identified. Even in 1940 and 1941, anchovy larvae were slightly more abundant than sardine larvae in the surveys made off southern California; the ratio of anchovy larvae to sardine larvae was 1.18:1 in 1940 and 1.66:1 in 1941.

Much less was known about the distribution of anchovy eggs and larvae than about that of sardine at the beginning of the CalCOFI surveys. During the 1949 cruises, anchovy larvae were taken off northern Oregon to Point San Eugenio, central Baja California, the north-to-south extent of the coverage. As the surveys became more intensive and extensive off California and Baja California, it was found that the vast majority of anchovy larvae were distributed between Point Conception, Calif. and Point San Juanico, Baja California (station lines 80-137).

A brief account of the distribution and relative abundance of anchovy eggs and larvae in

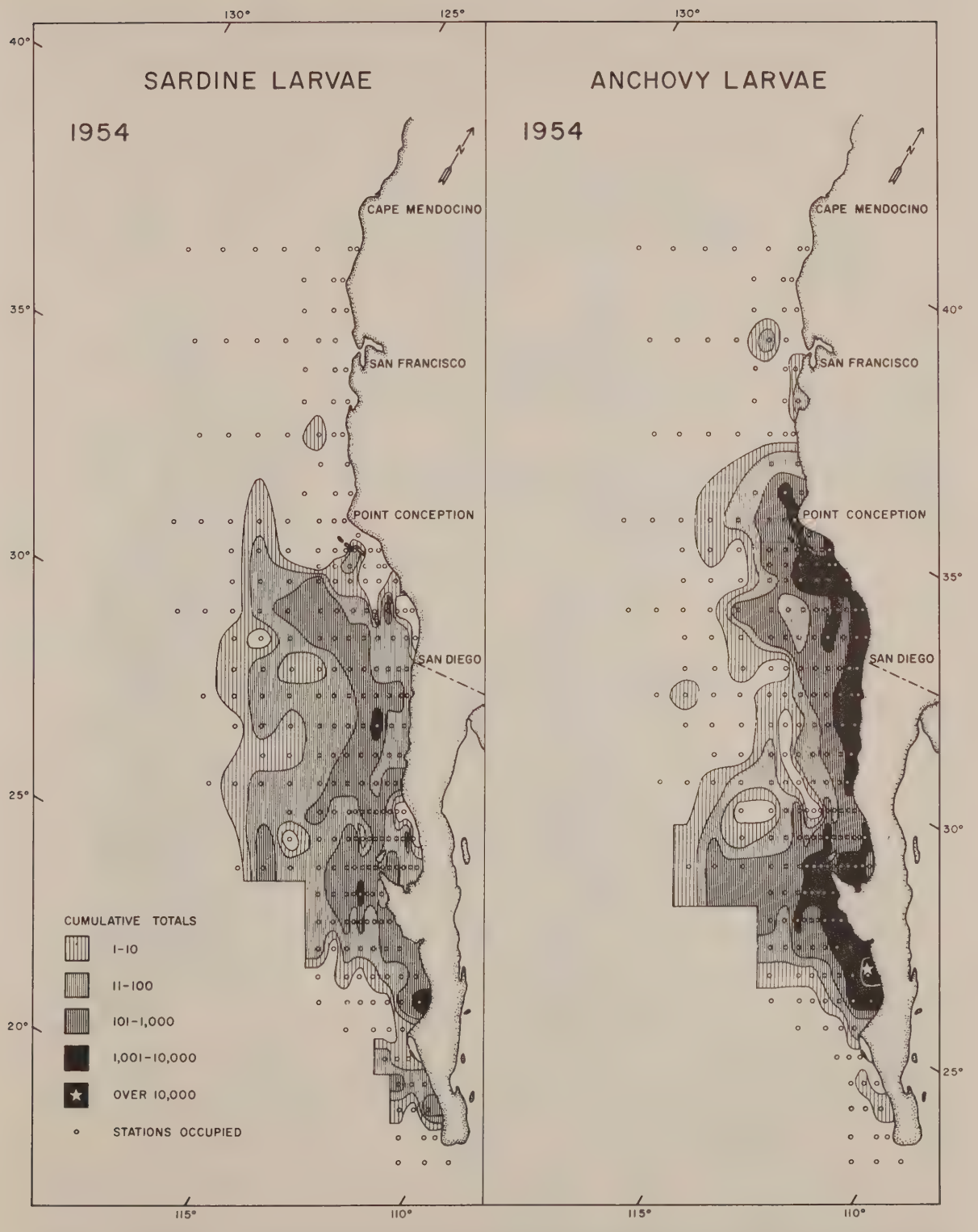


Figure 2.--Distribution and relative abundance of sardine and anchovy larvae in the CalCOFI survey area in 1954.

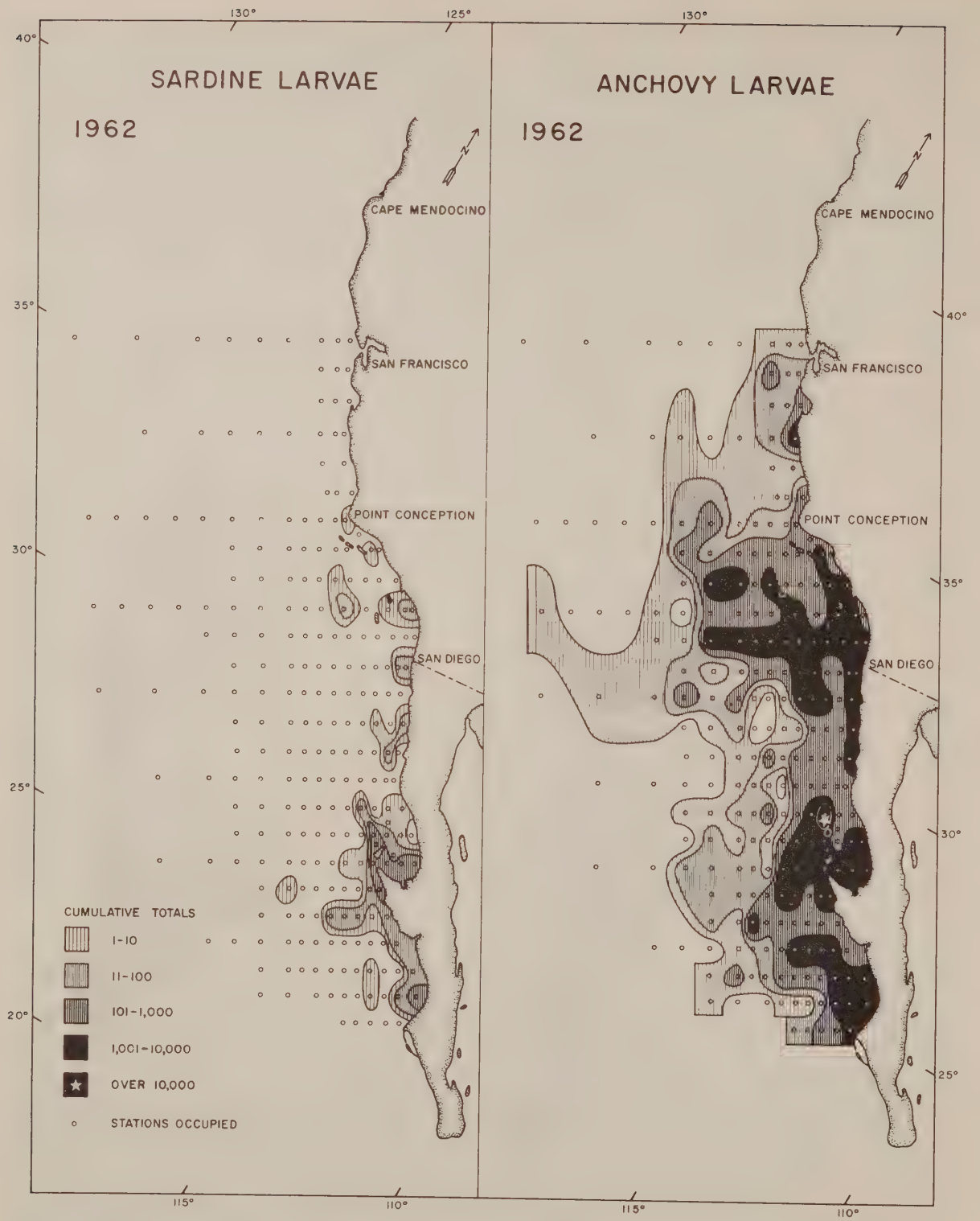


Figure 3.--Distribution and relative abundance of sardine and anchovy larvae in the CalCOFI survey area in 1962.

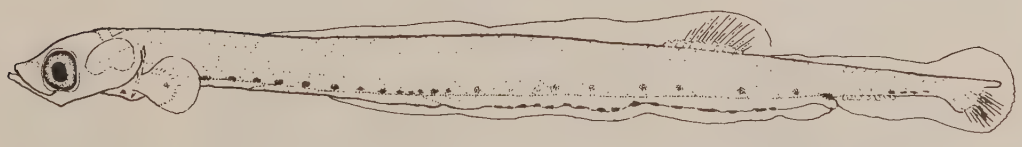
6.0 mm.

11.5 mm.

NORTHERN ANCHOVY

31.0 mm.

5.6 mm.



12.5 mm.

PACIFIC SARDINE

31.3 mm.

(Illustrations by George Mattson)

Figure 4.--Early life history stages of the northern anchovy and Pacific sardine. Upper: Northern anchovy larvae of 6.0 and 11.5 mm., and metamorphosing specimen of 31.0 mm. standard length. Lower: Pacific sardine larvae of 5.6 and 12.5 mm., and metamorphosing specimen of 31.3 mm. standard length.

the CalCOFI survey area in 1951-56 was given by Ahlstrom (1956). The temperature range over which anchovy eggs were taken in 1953 and 1954 was 9.9° to 23.3°C; most were taken within a 7°C. range, 12.0-18.9°C. (Ahlstrom, 1956).

The southern extent of anchovy spawning and its offshore extent in the area between San Francisco, Calif., and Magdalena Bay, Baja California, have been adequately circumscribed by CalCOFI survey cruises. The northern extent of anchovy spawning has not been adequately delimited, however. For example, we do not know how consistently anchovy spawning occurs off Oregon and Washington, or how large the adult stocks are in these waters.

Information from our surveys permits the assessment of the relative abundance of anchovy larvae off California and Baja California (table 4). The majority of anchovy larvae have occurred off Baja California in most years; the exceptions are 1957, 1959, and 1964 (table 5 and fig. 5).

Table 4. --Anchovy larvae--summary of occurrence and abundance by year and area, 1951-64

[Station lines given below each area]

	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
Year	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
Monthly cruises														
1951	49	500	89	6,928	59	2,530	107	8,643	95	10,739	11	211	410	29,551
1952	12	159	110	7,074	92	4,525	146	25,425	113	22,401	2	42	475	59,626
1953	2	7	228	36,694	91	9,960	180	31,918	144	20,581	0	0	645	99,160
1954	15	2,306	259	54,641	124	18,746	187	22,917	169	62,600	4	31	758	161,241
1955 1/	7	38	216	30,147	118	30,092	175	68,568	93	11,269	7	69	616	140,183
1956	5	629	168	17,838	82	8,463	151	61,565	107	20,884	23	25,552	536	134,931
1957	17	206	187	79,923	94	10,791	172	32,583	98	23,014	12	114	580	146,631
1958	101	8,132	272	78,374	145	32,588	164	52,802	85	33,002	11	835	778	205,733
1959	132	22,537	311	101,225	116	14,768	197	49,320	120	18,766	11	137	887	206,753
1960	47	2,493	279	69,358	191	58,323	250	84,761	172	71,497	26	3,428	965	289,860
Quarterly cruises														
1961	30	2,039	115	21,435	84	8,928	100	23,589	69	41,109	1	3	399	97,103
1962	26	2,131	130	62,810	90	34,594	105	66,033	92	45,477	11	1,630	454	212,675
1963	24	3,781	147	77,630	80	42,196	117	41,817	67	31,790	3	8,624	438	205,838
1964	46	16,533	150	95,848	92	8,955	88	23,332	56	21,554	3	295	435	166,517

1/ Norpac cruise not included.

Table 5. --Anchovy larvae--percentage of annual total taken in each area, 1951-64

[Station lines given below each area]

Year	Northern and central California 40-77	Southern California 80-93	Northern Baja California 97-107	Upper central Baja California 110-120	Lower central Baja California 123-137	Southern Baja California 140-157
Monthly cruises						
1951	1.69	23.45	8.56	29.25	36.34	0.71
1952	0.27	11.86	7.59	42.64	37.56	0.07
1953	0.01	37.00	10.04	32.19	20.76	0
1954	1.43	33.89	11.63	14.21	38.82	0.02
1955	0.03	21.51	21.47	48.90	8.04	0.05
1956	0.47	13.22	6.27	45.63	15.48	18.94
1957	0.14	54.51	7.36	22.22	15.70	0.08
1958	3.95	38.10	15.84	25.67	16.04	0.41
1959	10.90	48.98	7.14	23.85	9.08	0.07
1960	0.86	23.93	20.12	29.24	24.67	1.18
Quarterly cruises						
1961	2.10	22.07	9.19	24.32	42.31	0.01
1962	1.00	29.53	16.26	31.05	21.38	0.76
1963	1.84	37.71	20.50	20.32	15.44	4.19
1964	9.93	57.56	5.38	14.01	12.94	0.18

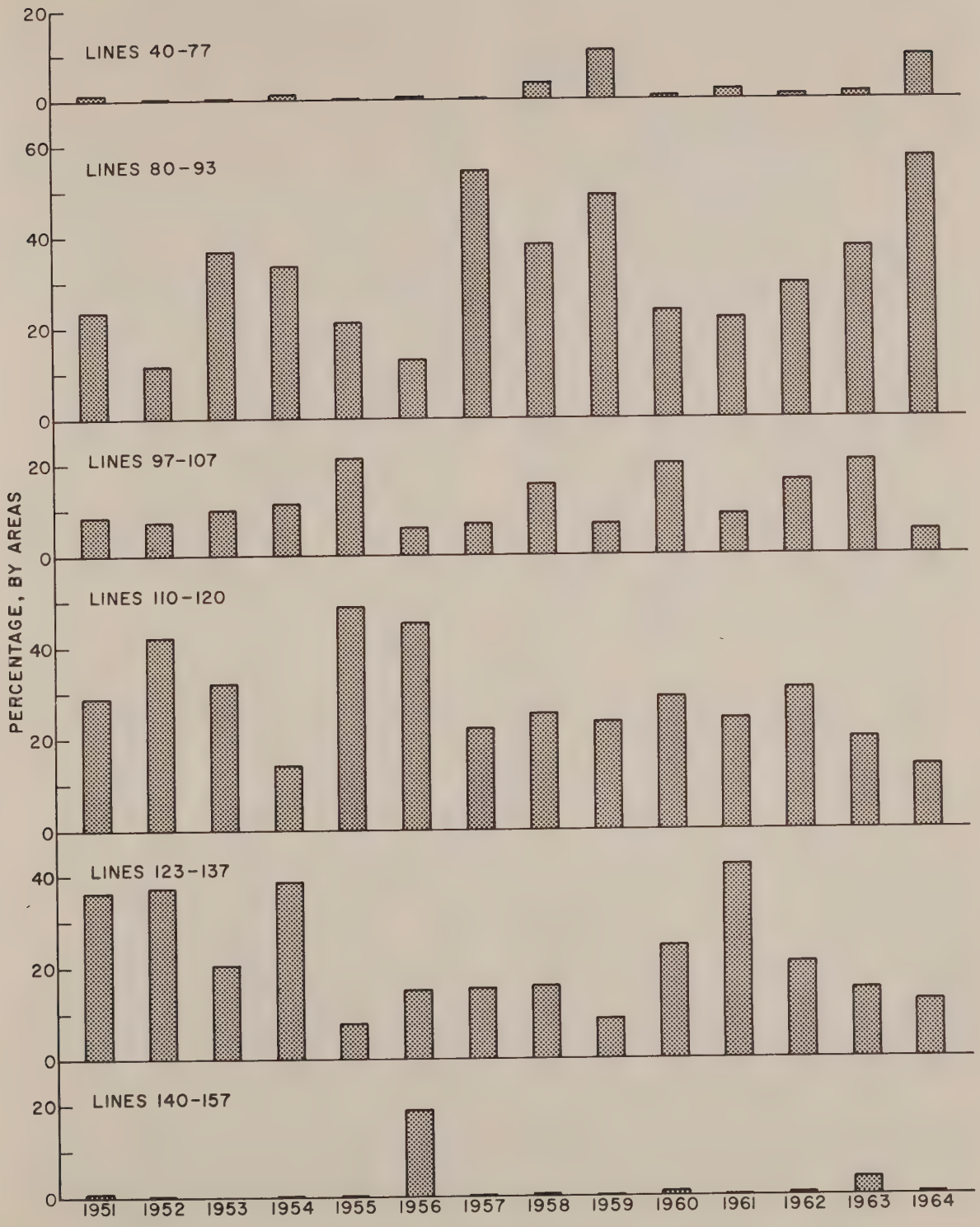


Figure 5.--Percentage of yearly totals of anchovy larvae taken in each area of the CalCOFI survey pattern, 1951-64.

Anchovy larvae were taken to the north of Point Conception, California, in all years; numbers ranged from insignificant (1953, 1955) to consequential (1958-64, especially 1959 and 1964). To evaluate better the importance of anchovy larvae in these waters, data on anchovy larvae have been summarized by 120-mile units (table 6). Each geographic unit contains one cardinal and two ordinal station lines, as 40, 43, 47. The tabulation by year and geographic unit summarizes three kinds of information: 1) number of stations occupied during the year, 2) number of hauls containing anchovy larvae, and 3) total number of larvae obtained (standardized haul totals).

Few anchovy larvae were taken off northern California either on lines 40-47 or lines 50-57. Less than 5 percent of the hauls from these two geographic units contained anchovy larvae, and the average number of larvae per positive haul was slightly less than 10; the average number per occupancy was less than 0.5.

The central California area as a whole was more important for anchovy eggs and larvae than was northern California. The portion of the central California area lying between Point Sur and Point San Luis (station lines 70-77) was consistently more important than the one between San Francisco and Monterey (station lines 60-67). Lines 60-67, San Francisco to Monterey, were occupied almost as frequently (934 collections in 14 years) as the section between Point Sur and Point San Luis (1,007 collections), but the positive hauls were fewer (167 compared to 335), and the average number of larvae per haul was markedly lower. In both areas the abundance increased sharply during 1958-64. In the San Francisco-Monterey area (lines 60-67, the average number of anchovy larvae per occupancy was only 0.8 during 1951-57, but was 10.6 during the following 7 years. The average number of larvae per positive haul increased from 8.1 to 41.4. The area between Point Sur and Point San Luis had almost 10 times as many larvae in both time periods: 7.1 per occupancy during 1951-57 and 100.5 per occupancy during the following 7 years. The average number of anchovy larvae per positive haul increased from 63.6 to 187.0. Obviously, this latter area is the most important one for anchovy larvae off central or northern California.

The distribution and abundance of anchovy larvae to the north of Point Conception have been presented in some detail to bring out the increasing importance of the region immediately to the north and the comparative scarcity of anchovy larvae off northern California. Markedly more anchovy larvae were obtained off southern California, however, than off central or northern California in all years (table 4 and fig. 5).

Table 6.--Anchovy larvae--occurrence and abundance off northern and central California, grouped by 120-mile latitudinal areas, 1951-64

[Station lines given below each latitudinal area: sta. occup.-number of stations occupied; occ.-number of occurrences]

Year	Point St. George to Cape Mendocino 40-47			Williams Point to Salt Point 50-57			San Francisco to Monterey 60-67			Point Sur to Point San Luis 70-77			Total northern and central California		
	Sta. occup.	Occ.	Number taken	Sta. occup.	Occ.	Number taken	Sta. occup.	Occ.	Number taken	Sta. occup.	Occ.	Number taken	Sta. occup.	Occ.	Number taken
Monthly cruises															
1951	23	2	12	22	4	13	130	27	246	113	16	229	288	49	500
1952	10	1	11	19	0	0	84	5	44	80	6	104	193	12	159
1953	-	-	-	-	-	-	55	1	4	64	1	3	119	2	7
1954	-	-	-	13	0	0	52	5	39	57	10	2,267	122	15	2,306
1955 1/	4	0	0	3	0	0	37	2	10	58	5	28	102	7	38
1956	28	0	0	26	0	0	55	1	2	57	4	627	166	5	629
1957	-	-	-	-	-	-	46	5	29	55	12	177	101	17	206
1958	22	2	9	19	3	68	101	27	974	128	69	7,081	270	101	8,132
1959	6	0	0	16	0	0	98	38	1,955	134	95	20,582	254	133	22,537
1960	25	0	0	37	0	0	70	9	345	95	38	2,148	227	47	2,493
Quarterly cruises															
1961	-	-	-	-	-	-	72	8	420	56	22	1,619	128	30	2,039
1962	-	-	-	-	-	-	48	13	404	37	13	1,727	85	26	2,131
1963	-	-	-	-	-	-	36	13	616	26	11	3,165	62	24	3,781
1964	-	-	-	-	-	-	50	13	300	47	33	16,233	97	46	16,533
Total	118	5	32	155	7	81	934	167	5,388	1,007	335	55,990	2,214	514	61,491

1/ Norpac cruise included.

SIZE COMPOSITION

The sizes of sardine larvae taken on monthly survey cruises, 1951-59, are summarized in tables 10-18, and of anchovy larvae in tables 38-46. Numbers of larvae of both species decreased markedly with increase in size. These tables are included to make size data available and to demonstrate that about the same proportions of larvae of different sizes are taken each year. To emphasize further the latter point, I have grouped the anchovy larvae into somewhat coarser size groupings, usually 3 mm., in table 7. This two-part table summarizes numbers of larvae by size group in the upper part and by percentages in the lower. In only 1 year, 1956, were percentages of small larvae conspicuously low and percentages of other size groupings of larvae correspondingly high. The consistency of representation of different sizes of larvae year after year is evidence that total numbers per se are meaningful values for comparing abundance of larvae.

Table 7.--Numbers of anchovy larvae of grouped sizes taken on CalCOFI surveys, 1951-59, and percentage contribution of each size group to annual total

Year	Size group (mm.) 2.00-6.25	6.26-9.25	9.26-12.25	12.26-15.25	15.26 and larger	Disintegrated	Total
Standardized numbers of larvae							
1951	16,346	9,357	2,598	603	165	480	29,549
1952	34,779	17,794	5,190	1,092	673	100	59,628
1953	64,182	24,020	8,526	1,690	602	140	99,160
1954	97,087	45,343	14,175	3,453	918	272	161,248
1955	84,544	38,075	13,627	2,819	958	169	140,192
1956	65,337	44,164	20,812	3,739	858	16	134,926
1957	81,814	43,647	16,837	3,344	908	78	146,628
1958	128,320	52,644	18,679	4,658	1,351	81	205,733
1959	132,751	47,101	18,887	5,099	2,065	850	206,753
Percentage of yearly total							
1951	55.33	31.67	8.79	2.04	0.56	1.62	100.01
1952	58.33	29.84	8.70	1.83	1.13	0.17	100.00
1953	64.73	24.22	8.60	1.70	0.61	0.14	100.00
1954	60.21	28.12	8.79	2.14	0.57	0.17	100.00
1955	60.31	27.16	9.72	2.01	0.68	0.12	100.00
1956	48.42	32.73	15.42	2.77	0.64	0.01	99.99
1957	55.80	29.77	11.48	2.28	0.62	0.05	100.00
1958	62.37	25.59	9.08	2.26	0.66	0.04	100.00
1959	64.21	22.78	9.14	2.47	1.00	0.41	100.01

INCREASE IN ABUNDANCE OF ANCHOVY LARVAE SINCE 1951

On the basis of increase in abundance of larvae, the anchovy population has increased markedly since 1951. To make the quarterly survey coverages obtained since 1961 equivalent with the more frequent coverages (mostly monthly) obtained during 1951-60, the following procedure has been adopted. For the decade 1951-60, average quarterly values derived for each year were based on data from the three or fewer comprehensive survey cruises made during the quarter; each yearly total represents the summation of "average" quarterly values (table 8). The data given for 1961-64 represent the quarterly survey totals, summed to obtain the yearly estimates.

The population increased rapidly between 1951 and 1954, reached a plateau that continued through 1957, increased rapidly again through 1962, and since then appears to have maintained a high level. A conservative method of estimating the increase in population size is to use the average of the annual estimates for 3 years at the beginning of the period of increase (1951-53), and of the most recent years (1962-64). The average number of anchovy larvae was 21,875 in 1951-53. In comparable coverage during 1962-64, the average number was 195,000. Thus, approximately nine times as many anchovy larvae were taken per year during the recent period as during the early 1950's. The increase in abundance is illustrated in figure 6.

Table 8. --Relative abundance of anchovy larvae in CalCOFI survey area, 1951-64, based on average quarterly estimates of abundance

Year	January March	April June	July September	October December	Total
Monthly cruises					
1951	4,040	2,465	1,163	2,158	9,826
1952	6,321	8,772	3,370	2,118	20,581
1953	14,954	5,100	4,248	10,012	34,314
1954	30,623	17,278	5,219	3,545	56,665
1955	32,058	11,115	7,057	866	51,096
1956	18,208	17,685	14,720	825	51,438
1957	24,363	19,811	8,886	861	53,921
1958	33,352	22,016	10,222	530	66,120
1959	25,313	40,835	6,419	165	72,732
1960	61,834	33,095	2,230	443	97,602
Quarterly cruises					
1961	46,510	38,653	11,449	491	97,103
1962	69,476	133,773	7,536	1,890	212,675
1963	121,794	77,547	4,499	1,998	205,838
1964	80,658	61,083	20,515	4,261	166,517

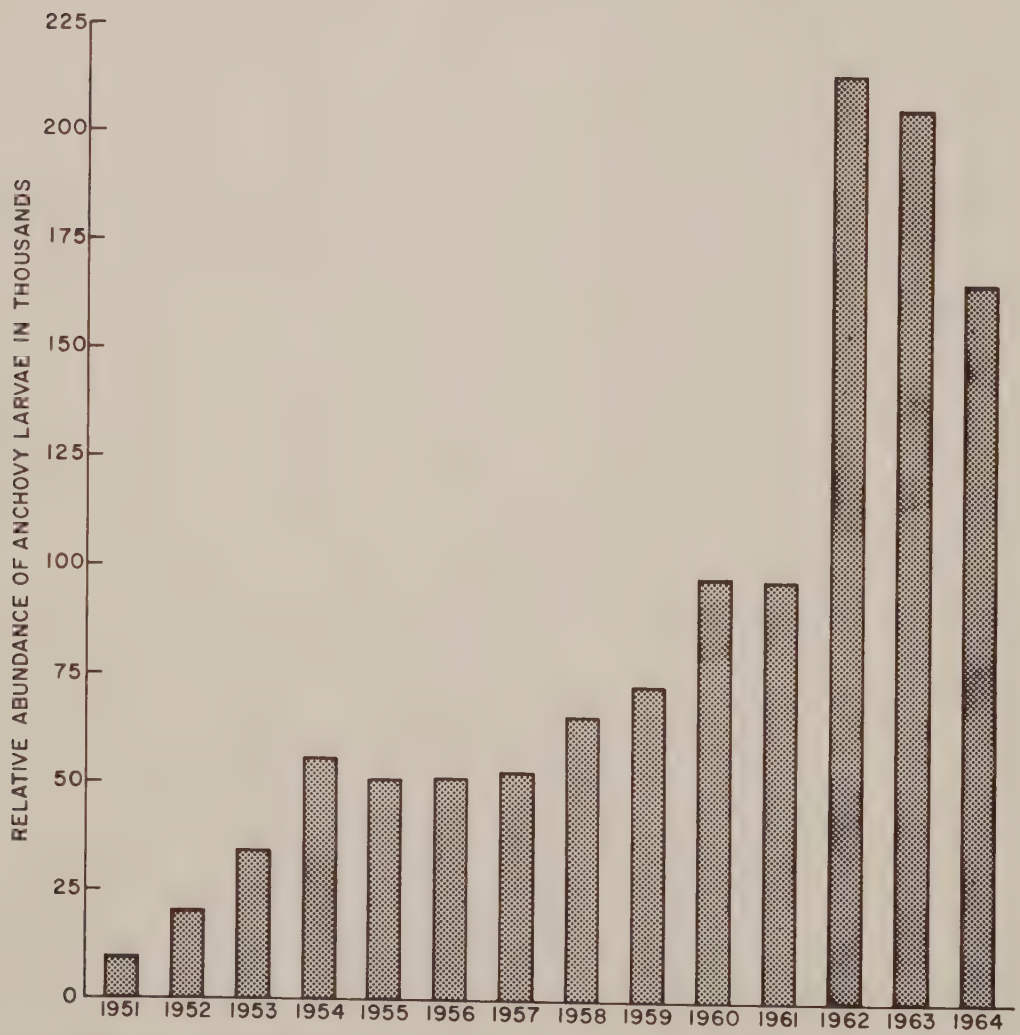


Figure 6.--Relative abundance of anchovy larvae in the CalCOFI survey area during 1951-64.

ABUNDANCE OF SARDINE LARVAE, 1951-64

Relative abundance of sardine larvae in the CalCOFI survey area, 1951-64, based on average quarterly estimates of abundance is given in table 9. Sardine larvae were most abundant in 1954, decreased to about a fourth of this abundance by 1959-60, and have remained at a low level of abundance since then. In recent years (1961-64) most sardine larvae have been collected off central Baja California (station lines 110-137).

We know from genetic studies utilizing blood antigens that the sardines off central Baja California are distinct from the stock off southern California. The latter has markedly decreased in abundance even relative to the "southern" stock of sardines off central Baja California.

Table 9.--Relative abundance of sardine larvae in CalCOFI survey area, 1951-64, based on average quarterly estimates of abundance

Year	January March	April June	July September	October December	Total
Monthly cruises					
1951	422	2,351	488	428	3,689
1952	1,430	4,304	571	132	6,437
1953	1,270	2,667	615	372	4,924
1954	3,145	5,042	727	450	9,364
1955	2,346	1,848	1,178	182	5,554
1956	1,692	1,160	2,321	6	5,179
1957	956	812	1,332	315	3,415
1958	1,979	381	1,432	53	3,845
1959	567	329	735	441	2,072
1960	1,225	180	1,051	643	3,099
Quarterly cruises					
1961	221	96	494	897	1,708
1962	611	154	1,113	380	2,258
1963	430	54	335	530	1,349
1964	1,608	28	730	391	2,757

TABLES CONTAINING INFORMATION ABOUT SARDINE AND ANCHOVY LARVAE

In the tables that follow, information on sardine larvae is presented before that for anchovy larvae. The sequence of tables is as follows:

Tables 10-18, Size composition of sardine larvae, summarized by monthly cruise for individual years, 1951-59.

Tables 19-23, Numbers of sardine larvae, tabulated by station, for 1958, 1959, 1960, 1961-62, and 1963-64.

Tables 24-37, Occurrence and abundance of sardine larvae summarized by cruise and area for individual years, 1951-64.

Tables 38-46, Size composition of anchovy larvae, summarized by monthly cruise for individual years, 1951-59.

Tables 47-51, Numbers of anchovy larvae, tabulated by station, for 1958, 1959, 1960, 1961-62, and 1963-64.

Tables 52-65, Occurrence and abundance of anchovy larvae summarized by cruise and area for individual years, 1951-64.

Table 66, Numbers of stations occupied on CalCOFI surveys, summarized by cruise and area, 1951-64.

It should be noted that small differences in cruise and yearly totals in some tables result from rounding off of values that originally were reported to the first decimal place.

Table 10. --Sardine larvae--monthly cruise summaries of numbers by size, 1951

Cruise	Midpoint of size class (mm.)																	
	3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1]	Total
5101	56	21	5																82
5102	244	32	11	2	4	4		2	4			2				2			307
5103	272	278	182	32	52	22	23	8	3	5	2			2					881
5104	858	531	165	58	66	31	22	12	12	12	5	7	2		2				1,783
5105	507	861	350	331	296	208	202	170	140	115	117	68	49	54	11	2			3,481
5106	70	112	164	150	196	164	124	125	151	123	108	77	32	67	15	31	24	54	1,787
5107	38	24	6	6	7	5	2				2								90
5108	276	177	197	168	156	146	92	43	12	7	2			2					1,278
5109	26	10	17	14	7	5	2	4		3			2	5					95
5110	4	11	20	19	12	2	14	12	19	6	2	3				9	7		140
5111	110	235	166	68	58	50	27	6	4	2	2				2				730
5112	259	53	30	12	11	5	2	1	18	2	4	13	3	3					416
Total	2,720	2,345	1,313	860	865	642	510	383	363	275	244	170	88	133	30	44	31	54	11,070

Table 11. --Sardine larvae--monthly cruise summaries of numbers by size, 1952

Cruise	Midpoint of size class (mm.)																	
	3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1]	Total
5201	396	196	10	25	34	37	14	18	7	20	10	7		7					781
5202	230	246	322	176	130	100	77	33	18	3	21	14	13	7	3	1			1,394
5203	223	391	134	82	64	126	205	278	244	201	100	52	14						2,114
5204	2481	1793	523	418	644	439	291	167	114	93	82	43	16	12	3	6	3	145	7,273
5205	779	893	510	456	208	92	56	33	8	18	24	46	6	5	17	17	7	22	3,197
5206	674	930	364	87	90	96	39	34	44	20	19	4	7	9	24	3			2,444
5207	15	8		3	8	30	50	21	10	11	9	12	6	22	22	5	13		245
5208	218	193	29	35	30	31	16		9	5				2			3		571
5209	22	30	130	262	178	54	27	38	15	12	26	40	45	17					896
5210	5	16	8	10	22	14	5	13	12	10		2	2	7	2	2			130
5211	15	26	6	14	12	6	12	2	3	8	14	3	5	9					135
5212																			-
Total	5,058	4,722	2,036	1,568	1,420	1,025	792	637	484	401	305	223	114	97	71	34	26	167	19,180

[1] Disintegrated larvae.

Table 12. --Sardine larvae--monthly cruise summaries of numbers by size, 1953

Cruise	Midpoint of size class (mm.)																	
	3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1]	Total
5301	60	36	14	15	40	36	16	78	21	15	13	8	5						357
5302	49	201	156	331	340	152	45	24	14	30	8	4							1,354
5303	268	468	191	120	217	129	49	88	105	160	126	68	34	52	6	4		11	2,096
5304	382	145	39	3		6	6	6	3	6	6	9	3	3	3			2	622
5305	1355	1858	517	255	82	51	32	24	42	35	12	18	17	5			5		4,308
5306	487	2056	264	99	66	32	24		15	5		5	8	3	9				3,073
5307	81	26	8			10	8												133
5308	143	13	23	42	35	57	19	13	17				11	17		6			396
5309	773	267	164	70	26	8	3		5										1,316
5310	209	98	66	18	6	12	10	13	14	34	19	19	16	26	4				564
5311																			0
5312	17		11	4	5	17	26	30	27	14	6	6	3	11	3				180
Total	3,824	5,168	1,453	957	817	510	238	276	263	299	190	137	97	117	25	10	5	13	14,399

Table 13. --Sardine larvae--monthly cruise summaries of numbers by size, 1954

Cruise	Midpoint of size class (mm.)																	
	3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1]	Total
5401	1340	929	887	230	188	87	51	70	49	23	21	19	18	18	6			3	3,939
5402	110	265	96	46	88	72	30	45	31	31	51	38	25	31	7				966
5403	1471	1538	468	239	190	200	220	111	45	2	8	3	3	11	11	2		9	4,531
5404	1389	1088	411	336	278	214	232	394	372	408	332	298	120	45	19	3			5,939
5405	1226	1213	471	275	137	86	87	174	76	21	24	14	29	9	10	3	19	3	3,877
5406	1548	1964	595	279	266	210	172	100	49	40	46	25	6	9	3				5,312
5407	362	133	62	48	43	21	8	3	2	7	3		3	3	3	3			704
5408	153	187	65	33	72	55	63	42	33	28	17	2							750
5409																			-
5410	16	40	5	4	12	5	8	3	11	3		3		3					113
5411																			-
5412	585	92	15	37	8	9	18	3		5		11		6					789
Total	8,200	7,449	3,075	1,527	1,282	959	889	945	668	568	502	413	204	135	59	11	19	15	26,920

[1] Disintegrated larvae.

Table 14. --Sardine larvae--monthly cruise summaries of numbers by size, 1955

Cruise	Midpoint of size class (mm.)																	
	3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25 & larger	Dis.[1]	Total
5501	1285	372	174	125	84	63	60	34	28	27	32	38	3	5					2,330
5502	860	844	501	154	102	61	77	100	103	83	71	72	47	37	13	4	3		3,132
5503	426	636	334	57	67	27	15	7	2					2	3				1,576
5504	329	778	611	302	200	89	112	47	65	54	44	21	11	20	5				2,688
5505	123	135	68	56	15	24	30	31	28	21	10	11	12	8	3	6			581
5506	333	1082	496	150	95	40	33	5		8	6	5	14	7					2,274
5507	139	591	188	54	43	30	50	8	11	30	14		11	3				6	1,178
5508																			-
5509																			0
5510	8	52	17	2			2					20	5	16	6				128
5511																			0
5512	26	79	24	6	11	16	13	4	12	8	12	11		8	5				235
Total	3,529	4,569	2,413	906	617	350	392	236	249	231	189	178	103	106	35	10	3	6	14,122

Table 15. --Sardine larvae--monthly cruise summaries of numbers by size, 1956

Cruise	Midpoint of size class (mm.)																	
	3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25 & larger	Dis.[1]	Total
5601	125	709	204	13	1	14	20	14	12	12		4		3					1,131
5602	779	562	232	265	210	185	161	175	29	82	41	71	74	53	6	12	6	3	2,946
5603	441	288	137	37	55	3	6		5	3			3		14	3		6	1,001
5604	136	447	153	5	27	3										4	5		780
5605	135	297	73	88	38	24	39	23	16	9	4	27			4				777
5606	576	731	248	77	30	49	70	50	7	22		12	18	25	6				1,921
5607	347	299	142	182	103	74	52	39	47	36	50		24	37	39	39			1,510
5608	2650	618	230	106	126	127	195	72	93	73	51	18	43	14					4,416
5609	18	10	13	95	248	339	140	71	57	11	7	14	6		7				1,036
5610	6																		6
5611																			0
5612																			0
Total	5,213	3,961	1,432	868	838	818	683	444	266	248	153	146	168	132	76	58	11	9	15,524

[1] Disintegrated larvae.

Table 16. --Sardine larvae--monthly cruise summaries of numbers by size, 1957

Cruise	Midpoint of size class (mm.)																	
	3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25 & larger	Dis.[1]	Total
5701	3	58	160	44	79	109	130	88	41	24	10	6	6					2	760
5702	115	86	126	73	55	38	38	63	62	50	61	105	49	19	3	3			946
5703	66	346	550	92	35	6	6	8	10	2			14	16	13				1,164
5704	26	101	251	20	15							3				5			421
5705	504	595	232	114	191	79	15												1,730
5706	14	80	27	9	20	15	22	19	19	8		3		27	13		3	4	283
5707	1096	134	42	70	27	32	24	14	3								4		1,446
5708	195	277	127	150	207	226	141	98	60	16	6	6	3	3					1,515
5709	37	79	115	93	114	110	142	143	84	56	27	9	12	9	3	2			1,035
5710	28	132	58	21	26	17	13	5	3	5				3	4				315
5711	168	14	18	7	7	5													219
5712																			0
Total	2,252	1,902	1,706	693	776	637	531	438	282	161	104	132	84	77	36	10	7	6	9,834

Table 17. --Sardine larvae--monthly cruise summaries of numbers by size, 1958

Cruise	Midpoint of size class (mm.)																Dis.[1]	Total
	3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	
5801	46	283	371	161	157	81	65	33	35	9	3		7	10					1,261
5802	1416	1034	371	252	318	155	123	83	50	20	9	9	20	6	4				3,870
5803	258	171	34	56	71	60	24	16	21	24	19	15	17	17	2				805
5804	87	63	30	105	160	86	21	16	6	16	6	3							599
5805	116	106	47	21	20	3	6		3	3	4			9	6	4			348
5806	17	59	45	44	15	3				2	5	6							196
5807	92	49	138	66	133	45	7	2	3	3	3								541
5808	65	348	329	306	240	101	47	14	15	6									1,471
5809	1046	559	311	182	97	44	29		6					3	3			3	2,283
5810	4	2	11				7	5	2	12	4	2	4						53
5811																			0
5812																			0
Total	3,147	2,674	1,687	1,193	1,211	578	329	169	141	95	53	35	48	45	15	4		3	11,427

[1] Disintegrated larvae.

Table 18. --Sardine larvae--monthly cruise summaries of numbers by size, 1959

Cruise	Midpoint of size class (mm.)																	
	3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1/] Total
5901	120	237	79	51	15	44	44	42	30	33	8	9	5	6	3			726
5902	286	294	191	50	14	8	6	6				2	3					860
5903	40	24	3				3	3	11	8	20	3						115
5904	225	90	42	16	11	14	22	27	5				3					455
5905	56	137	60	12	8	6	2	2	3			3		3				292
5906	61	93	23	6	28	9	3	12	3					3				241
5907	194	110	145	25	13	13	3	3	4	6	10				3	3		532
5908	146	151	77	43	28	60	48	24	10	16	17	4	3	6				633
5909	582	227	72	40	27	18	16	15	8	10	12	3	7	4				1,041
5910	215	58	26	40	34	27	19	14	2	3	3							441
5911																		0
5912	28	10																38
Total	1,953	1,431	718	283	178	199	166	148	76	76	70	24	21	22	6	3		5,374

[1/] Disintegrated larvae.

Table 19.--Sardine larvae--numbers by stations, 1958

Station	Cruise and month											
	5801 Jan.	5802 Feb.	5803 Mar.	5804 Apr.	5805 May	5806 June	5807 July	5808 Aug.	5809 Sept.	5810 Oct.	5811 Nov.	5812 Dec.
70.60	-	-	0	0	16	0	0	-	-	0	-	-
77.55	0	-	0	0	3	0	0	-	-	0	-	-
80.51	0	38	0	0	3	0	0	-	-	0	0	0
.55	0	203	0	0	0	0	0	-	-	0	0	0
82.47	5	356	83	3	8	0	0	-	-	0	0	0
83.40	-	96	5	0	22	0	14	-	-	0	0	0
.43	0	14	36	6	21	0	82	-	-	0	0	0
.51	0	35	0	21	5	0	6	-	-	0	0	0
.55	0	-	6	0	5	0	0	-	-	0	-	0
.90	-	-	-	-	6	0	0	-	-	0	-	-
87.35	10	0	0	27	0	0	6	-	-	0	0	0
.40	0	0	0	0	2	0	0	-	-	0	0	0
.45	0	0	0	0	3	0	0	-	-	0	0	0
.50	-	-	0	0	0	0	36	-	-	0	0	0
.55	0	-	0	0	0	0	7	-	-	0	[1/] NS	0
.60	0	-	0	0	4	0	0	-	[2/] -	0	0	0
90.28	-	0	6	3	35	3	0	-	3a	2	0	0
.30	-	0	43	0	90	13	0	-	0	0	0	-
.37	-	[3/] NQ	0	0	12	0	12	-	0	0	0	0
.45	-	0	0	3	16	0	0	-	0	0	0	0
.50	-	0	24	-	33	12	3	-	0	0	0	0
.55	-	0	0	0	0	0	42	-	0	0	0	0
.60	-	0	0	0	0	0	3	-	0	0	0	0
.70	-	0	0	0	11	0	0	-	0	0	0	0
93.27	3	49	3	6	0	5	0	-	0	0	0	0
.30	0	0	4	0	3	0	0	-	0	0	0	0
.40	0	0	4	0	0	0	0	-	0	0	0	0
.45	-	0	0	0	0	3	17	-	0	0	-	-
.50	0	0	0	3	0	58	6	-	0	0	0	0
.55	-	-	-	0	27	6	149	-	0	0	-	-
.60	0	0	0	0	0	32	90	-	0	0	0	0
.70	0	-	0	0	0	0	3	-	0	0	0	0
97.30	0	0	3	13	3	0	0	-	-	0	0	0
.32	0	0	10	15	0	-	0	-	-	0	0	0
.35	-	-	-	18	0	0	0	-	-	0	0	0
.45	-	0	0	206	0	0	0	-	-	0	-	-
.55	-	-	-	0	3	0	0	-	-	0	-	-
.60	0	0	0	3	0	0	0	-	-	0	0	0
.65	-	-	-	0	0	0	28	-	-	-	-	-
.70	0	0	0	0	3	0	0	-	-	0	-	-
100.30	0	0	0	3	0	-	0	-	-	0	0	0
.55	-	-	-	0	0	0	3	-	-	0	-	-
103.30	0	0	72	8	0	0	0	-	-	-	-	-
.35	0	0	21	55	0	0	5	-	-	0	-	-
.50	0	0	0	0	0	0	3	-	-	0	-	-
107.32	0	0	37	9	0	0	0	-	-	0	-	-
.35	0	0	15	5	0	0	0	-	-	0	-	-
.50	0	0	0	4	0	0	0	-	-	0	-	-
.55	-	-	-	7	3	-	0	-	-	0	-	-

See footnotes at end of table.

Table 19. --Sardine larvae--numbers by stations, 1958--Continued

Station	Cruise and month											
	5801 Jan.	5802 Feb.	5803 Mar.	5804 Apr.	5805 May	5806 June	5807 July	5808 Aug.	5809 Sept.	5810 Oct.	5811 Nov.	5812 Dec.
110.33	6	0	27	0	0	0	0	0	0	0	-	-
.35	0	0	4	0	0	0	0	0	0	0	-	-
.55	-	-	-	0	4	0	0	-	-	0	-	-
113.30	8	0	2	0	0	0	0	0	0	4	-	-
.45	-	0	0	0	3	0	0	-	-	0	-	-
.60	0	0	0	7	0	0	0	-	-	0	-	-
117.26	0	0	5	0	0	0	0	0	0	0	-	-
.30	0	0	0	0	0	0	0	0	0	6	-	-
.35	0	176	0	0	0	0	0	0	0	9	-	-
.40	0	10	0	0	0	0	0	0	0	0	-	-
118.39	0	386	26	0	0	0	0	-	-	0	-	-
118.25	-	-	-	-	-	-	-	3	3	-	-	-
.30	-	-	-	-	-	-	-	12	23	-	-	-
.35	-	-	-	-	-	-	-	23	89	-	-	-
119.33	112	0	0	0	0	3	0	0	162	0	-	-
120.25	-	1,003	68	0	0	2	5	0	26	10	-	-
.30	-	462	32	11	0	0	3	0	1,502	14	-	-
.35	35	63	11	0	0	0	10	0	469	2	-	-
.40	0	85	28	14	0	2	0	1,355	NQ	2	-	-
.45	0	0	0	0	0	9	0	75	0	0	-	-
.50	0	0	48	0	0	0	0	-	-	0	-	-
.70	0	0	0	122	0	0	0	-	-	0	-	-
123.37	0	14	0	18	0	0	0	0	0	0	-	-
.42	0	7	0	0	0	0	0	0	3	0	-	-
.50	0	0	54	0	0	0	0	-	-	0	-	-
.60	0	0	0	0	4	0	0	-	-	0	-	-
127.34	3	0	3	3	0	0	0	3	3	2	-	-
.40	0	0	7	0	0	0	0	0	0	0	-	-
.45	-	0	3	0	0	0	0	0	0	0	-	-
.60	0	0	0	3	0	-	0	-	-	0	-	-
130.30	184	0	9	0	0	0	0	0	0	0	-	-
.35	0	5	0	0	0	0	0	0	0	0	-	-
133.25	241	58	0	3	0	0	0	0	0	0	-	-
.30	0	557	2	0	0	0	0	0	0	0	-	-
137.23	3	201	14	0	0	48	8	0	0	0	-	-
.30	0	38	60	0	0	0	0	0	0	0	-	-
140.30	16	0	0	-	-	-	-	-	-	2	-	-
.35	0	6	0	-	-	-	-	-	-	0	-	-
143.26	2	0	27	-	-	-	-	-	-	0	-	-
.40	0	3	0	-	-	-	-	-	-	0	-	-
147.20	563	3	0	-	-	-	-	-	-	0	-	-
.25	0	2	0	-	-	-	-	-	-	0	-	-
.30	0	0	3	-	-	-	-	-	-	0	-	-
150.19	3	0	0	-	-	-	-	-	-	0	-	-
.25	60	0	0	-	-	-	-	-	-	0	-	-
.30	7	0	0	-	-	-	-	-	-	0	-	-
Total	1,261	3,870	805	599	348	196	541	1,471	2,283	53	0	0

1/ NS--sample spoiled or spilled.
2/ "a"--first of two or more samples taken at station during cruise.
3/ NQ--sample nonquantitative.

Table 20. --Sardine larvae--numbers by stations, 1959

Station	Cruise and month											
	5901 Jan.	5902 Feb.	5903 Mar.	5904 Apr.	5905 May	5906 June	5907 July	5908 Aug.	5909 Sept.	5910 Oct.	5911 Nov.	5912 Dec.
73.51	0	4	-	0	0	-	0	-	-	0	-	-
77.50	0	10	-	0	0	0	0	0	-	0	-	-
.55	0	16	-	0	-	0	0	0	-	0	0	0
.60	0	0	-	0	0	0	6	0	-	0	0	0
.65	-	-	-	0	0	0	3	-	-	-	-	-
80.52	0	40	-	0	0	0	3	0	-	0	0	3
.55	0	47	-	0	0	0	6	0	-	0	0	0
.60	0	0	-	0	0	0	182	0	-	0	0	0
.75	-	-	-	0	0	0	3	0	-	-	-	-
82.47	0	34	-	0	0	0	8	0	-	0	0	0
83.40	8	159	0	0	0	0	0	2	-	2	0	32
.43	40	165	0	3	3	6	0	0	-	3	0	0
.51	6	3	1/ NS	15	2	5	2	0	-	0	0	0
.55	3	0	-	0	0	0	8	0	-	0	0	0
.70	0	5	-	0	0	0	0	0	-	0	-	-
87.35	211	34	9	0	36	15	0	0	-	8	0	3
.40	18	25	0	12	3	2	0	0	-	0	0	0
.45	NS	-	19	34	0	0	0	0	-	0	0	0
.50	0	7	0	26	9	21	58	0	-	0	0	0
.55	0	0	-	0	6	0	3	0	-	0	0	0
.65	-	-	-	0	0	57	0	0	-	-	-	-
.70	6	0	-	0	0	3	0	0	-	0	-	-
90.28	6	0	0	43	113	0	0	0	0	25	0	0
.32	0	0	-	0	21	0	0	0	0	0	-	0
.45	0	0	0	0	0	33	0	0	0	0	0	0
.50	0	0	22	0	0	59	NS	0	0	0	0	0
.55	0	0	0	107	0	0	0	0	0	0	0	0
93.28	-	0	0	0	17	0	0	0	5	0	0	0
.50	0	3	0	0	3	0	0	0	0	0	0	0
.55	0	6	0	0	0	0	0	0	0	0	0	0
.60	0	0	0	0	0	0	6	0	0	0	0	0
97.30	0	0	0	2/ NQ	0	0	4	0	-	76	-	-
.40	0	0	0	0	6	0	0	0	-	0	-	-
.45	0	0	0	0	3	0	0	0	-	0	-	-
.55	0	0	3	NS	0	0	NQ	0	-	0	-	-
100.30	0	2	0	0	6	0	85	0	-	0	-	-
103.30	0	20	0	26	0	0	0	119	-	0	-	-
107.32	0	0	0	76	0	0	3	20	-	0	-	-
.35	0	0	0	0	0	0	0	9	-	0	-	-
.40	0	0	0	0	0	0	0	3	-	0	-	-

See footnotes at end of table.

Table 20. --Sardine larvae--numbers by stations, 1959--Continued

Station	Cruise and month											
	5901 Jan.	5902 Feb.	5903 Mar.	5904 Apr.	5905 May	5906 June	5907 July	5908 Aug.	5909 Sept.	5910 Oct.	5911 Nov.	5912 Dec.
110.33	0	3	8	17	0	0	0	0	0	0	-	-
.35	0	3	0	0	0	0	0	0	0	0	-	-
113.30	0	8	0	0	0	0	NS	2	0	6	-	-
.35	0	0	0	2	0	0	0	0	5	0	-	-
.40	NS	3	0	26	0	0	0	0	3	0	-	-
115.40	-	-	-	-	-	-	-	-	2	-	-	-
117.26	4	0	0	0	0	0	51	0	3	0	-	-
.30	0	0	0	0	0	0	0	24	0	0	-	-
.35	0	0	0	0	0	0	0	0	3	0	-	-
.50	0	3	0	0	0	0	0	0	-	0	-	-
118.39	0	0	0	5	0	0	0	0	0	0	-	-
118.35		-	-	-	-	-	-	-	3	-	-	-
119.33	24	0	0	3	0	0	0	0	316	133	-	-
120.25	3	55	10	5	0	10	24	16	2	2	-	-
.30	104	5	0	0	0	0	0	0	56	0	-	-
.35	28	0	0	0	0	0	0	0	70	129	-	-
.40	0	19	0	0	64	0	74	0	60	2	-	-
.45	5	64	0	0	0	0	3	0	0	0	-	-
.50	2	32	0	0	0	0	0	0	-	0	-	-
120.24	-	-	-	-	-	-	-	-	54	-	-	-
121.34	-	-	-	-	-	-	-	-	332	-	-	-
121.30	-	-	-	-	-	-	-	-	122	-	-	-
123.37	0	0	3	-	0	0	0	30	5	53	-	-
.42	5	0	0	-	0	24	0	0	0	0	-	-
.45	21	0	0	-	0	0	0	NS	0	0	-	-
.70	0	-	-	-	0	0	0	9	-	0	-	-
127.34	12	0	0	-	0	0	0	13	0	2	-	-
.40	10	0	0	-	0	0	0	0	0	0	-	-
130.30	25	0	0	0	0	0	0	379	0	0	-	-
.35	0	3	0	0	0	0	0	1	0	0	-	-
.40	0	0	0	14	0	0	0	0	0	0	-	-
.45	0	0	0	41	0	0	0	0	0	0	-	-
.60	0	0	0	0	0	6	0	0	-	0	-	-
133.25	0	29	0	0	0	0	0	-	0	0	-	-
.30	0	14	0	0	0	0	0	6	0	0	-	-
137.23	2	39	41	0	0	0	0	0	0	0	-	-
143.26	87	-	-	0	-	-	-	0	-	-	-	-
.30	68	-	-	0	-	-	-	0	-	-	-	-
147.30	11	-	-	0	-	-	-	0	-	-	-	-
.35	15	-	-	0	-	-	-	0	-	-	-	-
150.19	2	-	-	-	-	-	-	0	-	-	-	-
Total	726	860	115	455	292	241	532	633	1,041	441	0	38

1/ NS--sample spoiled or spilled.
2/ NQ--sample nonquantitative.

Table 21. --Sardine larvae--numbers by stations, 1960

Station	Cruise and month											
	6001 Jan.	6002 Feb.	6003 Mar.	6004 Apr.	6005 May	6006 June	6007 July	6008 Aug.	6009 Sept.	6010 Oct.	6011 Nov.	6012 Dec.
80.53	3	0	-	0	-	-	-	-	-	-	-	-
.60	0	0	0	0	-	3	0	-	-	0	-	-
82.47	0	0	0	0	0	0	0	0	-	3	-	-
83.40	0	0	3	0	0	0	0	0	-	0	-	-
.43	0	0	0	4	0	0	0	0	-	0	-	-
.51	44	28	13	0	0	0	0	0	-	0	-	-
87.35	6	0	9	0	12	0	0	0	-	0	-	-
.40	29	0	1/ 0	0	0	0	0	0	-	0	-	-
.45	3	0	NQ	0	0	0	0	0	-	0	-	-
.70	0	0	0	0	-	0	3	-	-	-	-	-
90.28	0	0	0	0	9	56	0	0	-	2	-	-
.32	0	0	0	0	-	6	9	0	-	0	-	-
.37	0	0	8	0	0	0	0	0	-	0	-	-
.45	0	5	3	0	0	0	0	0	-	0	-	-
.50	0	0	2	0	25	0	-	-	-	-	-	-
.55	0	NQ	0	3	0	0	-	-	-	-	-	-
.60	9	0	0	0	0	0	0	0	-	0	-	-
93.28	0	NQ	4	27	0	0	2	51	-	0	-	-
.30	0	NQ	5	0	0	26	0	0	-	0	-	-
.35	0	3	0	0	7	0	0	0	-	0	-	-
.40	0	0	2/ 0	0	264	0	0	0	-	0	-	-
.50	0	0	NS	0	20	0	0	0	-	0	-	-
.55	0	3	0	0	0	0	0	-	-	0	-	-
.65	-	-	-	0	3	0	0	-	-	0	-	-
97.30	8	0	6	0	2	0	5	25	-	0	-	-
.32	0	10	2	0	0	0	0	0	-	0	-	-
100.29	0	0	0	0	-	3	-	3	-	-	-	-
.30	0	6	0	0	-	0	6	8	-	0	-	-
.40	0	0	3	0	-	0	0	0	-	0	-	-
.80	0	0	0	0	-	0	0	-	-	3	-	-
103.30	5	6	0	0	0	-	5	0	0	0	-	-
.50	0	0	0	0	3	0	0	-	-	-	-	-
.55	0	0	0	0	3	0	0	-	-	-	-	-
107.32	0	19	0	0	0	0	3	0	0	0	-	-
.35	0	0	3	0	0	0	0	3	0	0	-	-
.40	0	0	0	0	0	0	3	0	0	0	-	-
.45	0	0	0	0	0	0	18	-	-	-	-	-
.50	0	0	0	0	0	0	9	-	-	-	-	-
110.35	0	0	9	0	0	0	3	0	0	0	-	-

See footnotes at end of table.

Table 21. --Sardine larvae--numbers by stations, 1960--Continued

Station	Cruise and month											
	6001 Jan.	6002 Feb.	6003 Mar.	6004 Apr.	6005 May	6006 June	6007 July	6008 Aug.	6009 Sept.	6010 Oct.	6011 Nov.	6012 Dec.
110.60	0	0	3	0	0	0	0	-	-	0	-	-
113.30	0	0	0	0	0	0	0	2	0	0	-	-
.40	0	0	0	0	0	0	0	0	0	3	-	-
.50	0	0	0	0	0	0	6	-	-	-	-	-
.55	0	0	0	0	0	0	158	-	-	-	-	-
117.26	0	0	0	0	0	0	0	3	2	3	-	-
.30	0	0	0	0	0	0	0	0	3	0	-	-
.40	0	0	0	0	0	0	0	0	55	0	-	-
.45	0	0	3	0	0	0	0	-	-	-	-	-
118.39	0	0	0	0	0	0	40	0	-	0	-	-
118.25	-	-	-	-	-	-	-	-	13	-	-	-
.30	-	-	-	-	-	-	-	-	2	-	-	-
119.33	0	0	0	0	0	0	54	0	0	190	-	-
120.25	0	0	0	4	0	0	20	1,676	40	142	-	-
.30	0	0	0	0	0	5	117	192	0	11	-	-
.35	0	0	0	2	0	9	32	0	0	130	-	-
.40	0	58	5	18	0	10	6	6	0	76	-	-
.45	0	0	0	0	0	0	0	72	-	27	-	-
.50	0	0	0	0	0	0	6	-	-	0	-	-
123.37	0	0	0	0	7	0	0	0	-	50	-	-
127.34	0	1	0	0	0	0	0	0	-	3	-	-
130.30	0	0	0	0	0	0	0	2	-	0	-	-
133.25	0	0	0	0	0	0	7	100	-	-	-	-
.30	0	18	0	0	0	0	20	16	-	-	-	-
.40	0	0	0	6	0	0	0	-	-	-	-	-
137.23	1,166	56	2	0	0	4	296	0	-	0	-	-
.30	437	0	0	0	0	0	0	36	-	0	-	-
140.30	5	-	-	0	-	-	-	0	-	-	-	-
.45	3	-	-	0	-	-	-	-	-	-	-	-
143.26	377	-	-	0	-	-	-	15	-	-	-	-
.30	948	-	-	0	-	-	-	-	-	-	-	-
.35	230	-	-	0	-	-	-	-	-	-	-	-
147.20	92	-	-	0	-	-	-	-	-	-	-	-
150.35	5	-	-	0	-	-	-	-	-	-	-	-
.40	3	-	-	0	-	-	-	-	-	-	-	-
153.20	6	-	-	0	-	-	-	-	-	-	-	-
Total	3,379	213	83	64	355	122	828	2,210	115	643	-	-

1/ NQ--sample nonquantitative.
2/ NS--sample spoiled or spilled.

Table 22.--Sardine larvae--numbers by stations, 1961-62

[Asterisks indicate sorters' counts]

Station	Cruise and month							
	6101-02 Jan.-Feb.	6104-05 Apr.-May	6107 July	6110-11 Oct.-Nov.	6201-02 Jan.-Feb.	6203-04 Mar.-Apr.	6207-08 July-Aug.	6210-11 Oct.-Nov.
80.53	-	-	-	-	-	-	2	-
82.47	0	0	0	3	0	0	0	0
83.40	0	0	0	34	0	0	0	0
.43	0	10	0	11	0	0	0	2
.51	10	0	0	0	0	0	0	0
.65	0	0	3	0	0	0	0	0
87.35	0	0	0	3*	0	0	0	0
.50	58	0	2*	0	0	0	0	0
.55	3	0	0	0	0	0	3	3
90.28	0	0	19*	0	0	23	11	0
.30	-	-	-	-	-	-	67	-
.37	0	11	0	0	3	0	-	0
.53	0	0	0	0	0	36	-	0
93.50	0	11	0	0	0	0	0	0
.55	0	0	3	0	0	0	0	0
.65	0	23	0	0	0	0	0	0
.70	0	11	0	0	0	0	0	0
97.30	0	0	29	0	7	0	7	0
.32	0	3	0	0	23	0	0	0
100.35	0	6	0	0	0	0	0	0
.60	0	18	0	0	0	0	0	0
103.30	0	0	0	0	0	41	0	0
.40	0	0	0	0	0	0	2	0
107.32	0	0	10	0	0	0	0	0
.35	0	0	0	3	0	19	0	0
113.30	0	0	0	3	0	0	0	2
.35	0	0	0	0	0	0	0	3
.45	0	0	0	0	0	6	0	15
115.35	0	-	4	-	0	0	0	3
117.26	0	0	8	0	0	0	0	0
.30	0	0	0	0	0	0	0	2
.35	0	0	0	0	0	0	12	3
.40	0	0	0	21	0	0	307	11
118.39	3	0	0	3	3	0	81	17
119.33	0	-	0	0	0	0	39	0
120.25	2	0	2	2	0	0	181	0
.30	0	0	154	0	0	0	132	0
.35	0	0	164	0	0	0	141	0
.40	0	[1/] 0a	47a	19	33	21	64	0
.45	0	0	0	176	0	0	10	0
.50	0	0	0	46	0	5	0	0
123.37	113	0	3	400	230	0	0	146
.42	26	3	0	30	3	0	5	3
.70	-	0	0	0	0	0	0	6
127.34	0	0	0	5	0	0	7	8
.40	0	0	0	0	0	0	0	3
.45	0	0	0	0	0	0	0	33
.50	0	0	0	0	0	0	23	6
.55	0	0	0	0	0	0	19	0
130.30	0	0	0	108	0	0	0	58
133.25	0	0	0	11	17	3	-	56
.35	6	0	0	3	0	0	-	0
.40	0	0	0	0	5	0	-	0
137.23	0	0	46	3	268	0	-	0
.30	0	0	0	0	16	0	-	0
.40	0	0	0	0	3	0	-	0
140.30	-	-	-	13	0	0	-	0
Total	221	96	494	897	611	154	1,113	380

[1/] "a"--first of two or more samples taken at station during cruise.

Table 23.--Sardine larvae--numbers by stations, 1963-64

[Asterisks indicate sorters' counts]

Station	Cruise and month							
	6301-02 Jan.-Feb.	6304-05 Apr.-May	6307-08 July-Aug.	6310 Oct.	6401-02 Jan.-Feb.	6404 Apr.	6406-07 June-July	6410 Oct.
70.53	0	8*	-	-	0	0	0	-
80.70	0	0	5	0	0	0	0	0
82.47	0	0	0	2*	0	0	0	0
83.40	0	0	2	0	0	0	0	2
.51	0	0	0	14*	0	0	0	0
87.35	137*	0	0	0	0	0	0	0
90.28	0	0	0	20*	0	0	13*	0
.32	0	0	3	3*	0	0	0	0
97.30	14*	2*	0	0	2*	0	0	0
.32	29*	0	0	0	0	0	0	6
.35	0	0	0	0	0	0	0	62
100.60	0	6*	0	0	0	0	0	0
.65	0	11*	0	0	0	0	0	0
103.30	0	0	3	7*	0	0	0	0
107.32	0	0	117	20*	0	0	0	0
.35	97*	0	50	20*	0	0	0	0
.40	127*	0	0	12*	0	0	0	0
110.32	0	0	0	0	0	0	164*	0
.35	0	0	5	0	0	0	3*	0
113.30	0	0	5	1*	0	0	23*	0
.40	9*	0	0	0	0	0	0	0
117.26	0	0	20	0	0	0	22*	0
.60	0	0	0	3*	0	0	0	0
119.33	0	0	0	10*	0	0	6*	12
120.25	0	0	16	200*	0	0	21*	0
.30	0	0	2	41*	0	0	12*	0
.35	0	0	0	79*	0	0	0	0
.40	0	24*	13	48*	1*	25*	2*	4
.45	0	0	0	0	0	0	0	3
123.37	0	0	0	34*	0	0	2*	0
.42	0	0	0	0	12*	0	0	7
.45	0	0	0	0	3*	0	0	0
.50	0	0	0	0	0	3*	0	0
127.34	0	0	0	16*	0	0	0	8
130.30	0	0	94	0	0	0	0	40
.35	0	0	0	0	1,228*	0	0	6
.40	0	0	0	0	49*	0	0	0
133.25	0	0	0	0	4*	0	0	73
.30	0	0	0	0	0	0	3*	0
137.23	9*	3*	-	0	276*	0	430*	168
140.30	8*	0	-	-	33*	-	26*	-
.50	0	0	-	-	0	-	3*	-
Total	430	54	335	530	1,608	28	730	391

Table 24. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1951

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5101	0	0	0	0	0	0	1	11	1	71	-	-	2	82
5102	-	-	1	7	1	2	2	66	4	230	-	-	8	305
5103	-	-	3	5	2	3	5	563	5	307	1	2	16	880
5104	0	0	7	147	7	97	8	503	8	1,038	-	-	30	1,785
5105	0	0	3	55	8	532	8	669	12	2,225	-	-	31	3,481
5106	1	2	6	73	8	124	4	279	10	1,205	6	102	35	1,785
5107	0	0	3	23	0	0	2	55	3	12	-	-	8	90
5108	0	0	0	0	0	0	5	867	7	413	-	-	12	1,280
5109	0	0	0	0	0	0	6	63	2	21	1	11	9	95
5110	0	0	0	0	0	0	3	135	1	4	-	-	4	139
5111	0	0	0	0	0	0	4	551	1	178	-	-	5	729
5112	0	0	0	0	0	0	7	326	2	91	-	-	9	417
Total	1	2	23	310	26	758	55	4,088	56	5,795	8	115	169	11,068

Table 25. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1952

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-150		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5201	-	-	0	0	0	0	4	181	8	599	-	-	12	780
5202	-	-	2	8	0	0	9	359	7	423	6	604	24	1,394
5203	-	-	2	15	1	10	10	512	11	1,578	-	-	24	2,115
5204	-	-	1	3	2	24	10	1,695	24	5,548	-	-	37	7,270
5205	0	0	4	314	7	262	17	1,075	17	1,547	-	-	45	3,198
5206	0	0	8	193	8	37	17	2,047	8	166	-	-	41	2,443
5207	0	0	6	179	2	14	6	34	2	19	-	-	16	246
5208	0	0	1	3	0	0	4	495	3	75	-	-	8	573
5209	0	0	1	3	1	2	3	22	5	868	-	-	10	895
5210	0	0	0	0	0	0	4	92	4	38	-	-	8	130
5211	0	0	0	0	0	0	6	111	4	24	-	-	10	135
5212	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	0	0	25	718	21	349	90	6,623	93	10,885	6	604	235	19,179

Table 26. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1953

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-150		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5301	-	-	0	0	0	0	2	19	4	92	7	247	13	358
5302	-	-	1	3	0	0	9	646	8	706	-	-	18	1,355
5303	-	-	0	0	2	22	12	925	13	1,148	-	-	27	2,095
5304	0	0	0	0	4	27	18	559	3	36	-	-	25	622
5305	0	0	0	0	1	3	15	2,639	16	1,664	-	-	32	4,306
5306	0	0	1	6	0	0	13	2,852	11	216	-	-	25	3,074
5307	0	0	1	6	0	0	1	15	5	112	-	-	7	133
5308	0	0	0	0	0	0	5	116	10	280	-	-	15	396
5309	-	-	0	0	-	-	15	1,317	-	-	-	-	15	1,317
5310	-	-	0	0	1	4	5	340	7	220	-	-	13	564
5311	-	-	0	0	-	-	-	-	-	-	-	-	0	0
5312	-	-	0	0	0	0	3	25	7	155	-	-	10	180
Total	0	0	3	15	8	56	98	9,453	84	4,629	7	247	200	14,400

Table 27. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1954

[Station lines given below each area]

Cruise	Northern and central California 50-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-147		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5401	0	0	1	3	0	0	7	243	10	2,037	8	1,656	26	3,939
5402	-	-	2	5	1	11	14	465	11	484	-	-	28	965
5403	0	0	0	0	16	548	20	2,075	13	1,907	-	-	49	4,530
5404	0	0	3	25	27	1,421	33	1,155	20	3,336	-	-	83	5,937
5405	-	-	16	629	20	924	31	1,921	9	403	-	-	76	3,877
5406	1	5	14	2,950	19	1,979	14	360	3	17	-	-	51	5,311
5407	0	0	6	214	7	112	2	113	11	265	-	-	26	704
5408	0	0	0	0	1	16	5	265	11	470	-	-	17	751
5409	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5410	0	0	0	0	1	3	4	27	3	82	-	-	8	112
5411	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5412	-	-	0	0	0	0	2	15	5	740	3	33	10	788
Total	1	5	42	3,826	92	5,014	132	6,639	96	9,741	11	1,689	374	26,914

Table 28. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1955

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5501	-	-	0	0	0	0	14	830	8	272	8	1,227	30	2,329
5502	-	-	0	0	6	175	15	2,295	9	326	7	336	37	3,132
5503	-	-	2	9	11	351	11	887	5	325	1	4	30	1,576
5504	-	-	3	16	28	2,030	26	622	4	17	-	-	61	2,685
5505	0	0	4	27	20	401	6	146	2	8	-	-	32	582
5506	0	0	10	1,444	6	198	3	604	2	29	-	-	21	2,275
5507	0	0	7	221	1	6	6	891	7	60	-	-	21	1,178
5508[1/]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5509	-	-	0	0	-	-	-	-	-	-	-	-	0	0
5510	0	0	0	0	0	0	6	93	5	36	-	-	11	129
5511	-	-	0	0	-	-	-	-	-	-	-	-	0	0
5512	-	-	0	0	0	0	6	146	4	72	1	17	11	235
Total	0	0	26	1,717	72	3,161	93	6,514	46	1,145	17	1,584	254	14,121

1/ Norpac cruise not included.

Table 29. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1956

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5601	-	-	0	0	0	0	4	100	5	59	2	970	11	1,129
5602	-	-	0	0	0	0	7	1,704	5	765	7	479	19	2,948
5603	-	-	0	0	10	147	12	506	8	346	-	-	30	999
5604	0	0	0	0	4	71	6	654	2	45	2	9	14	779
5605	0	0	7	220	8	270	4	288	0	0	-	-	19	778
5606	0	0	13	1,311	10	315	3	220	2	76	-	-	28	1,922
5607	0	0	1	11	7	360	8	1,129	2	12	-	-	18	1,512
5608	-	-	-	-	-	-	12	3,624	8	791	-	-	20	4,415
5609	-	-	-	-	-	-	5	66	6	969	-	-	11	1,035
5610	-	-	1	6	0	0	-	-	-	-	-	-	1	6
5611	-	-	0	0	0	0	-	-	-	-	-	-	0	0
5612	-	-	0	0	0	0	-	-	-	-	-	-	0	0
Total	0	0	22	1,548	39	1,163	61	8,291	38	3,063	11	1,458	171	15,523

Table 30. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1957

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5701	-	-	-	-	0	0	7	183	6	576	-	-	13	759
5702	-	-	0	0	3	114	10	317	5	164	5	349	23	944
5703	-	-	0	0	4	254	10	671	8	209	4	31	26	1,165
5704	-	-	3	370	3	44	2	8	0	0	0	0	8	422
5705	0	0	8	1,332	3	239	2	151	2	8	-	-	15	1,730
5706	4	87	8	60	7	55	4	34	0	0	3	48	26	284
5707	2	7	1	48	2	51	11	1,338	1	3	-	-	17	1,447
5708	-	-	-	-	-	-	14	1,257	5	256	-	-	19	1,513
5709	-	-	-	-	-	-	15	1,016	1	20	-	-	16	1,036
5710	-	-	0	0	0	0	8	278	3	37	-	-	11	315
5711	0	0	1	218	0	0	-	-	-	-	-	-	1	218
5712	-	-	0	0	-	-	-	-	-	-	-	-	0	0
Total	6	94	21	2,028	22	757	83	5,253	31	1,273	12	428	175	9,833

Table 31. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1958

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5801	0	0	3	18	0	0	4	161	4	431	6	651	17	1,261
5802	-	-	7	791	0	0	7	2,185	7	880	4	14	25	3,870
5803	0	0	10	214	6	158	10	251	8	152	2	30	36	805
5804	0	0	8	72	12	346	4	154	4	27	-	-	28	599
5805	2	19	18	306	4	12	2	7	1	4	-	-	27	348
5806	0	0	8	132	0	0	4	16	1	48	-	-	13	196
5807	0	0	15	476	4	39	3	18	1	8	-	-	23	541
5808	-	-	-	-	-	-	5	1,468	1	3	-	-	6	1,471
5809	-	-	1	3	-	-	7	2,274	2	6	-	-	10	2,283
5810	0	0	1	2	0	0	7	47	1	2	1	2	10	53
5811	-	-	0	0	0	0	-	-	-	-	-	-	0	0
5812	-	-	0	0	0	0	-	-	-	-	-	-	0	0
Total	2	19	71	2,014	26	555	53	6,581	30	1,561	13	697	195	11,427

Table 32. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1959

[Station lines given below each area]

Cruise	Northern and central California 43-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken
5901	0	0	8	298	0	0	7	170	6	75	5	183	26	726
5902	3	30	12	528	2	22	10	195	4	85	0	0	31	860
5903	0	0	3	50	1	3	2	18	2	44	0	0	8	115
5904	0	0	7	240	2	102	6	58	2	55	0	0	17	455
5905	0	0	10	213	3	15	1	64	0	0	0	0	14	292
5906	0	0	9	201	0	0	1	10	2	30	0	0	12	241
5907	2	9	10	279	3	92	4	152	0	0	0	0	19	532
5908	-	-	1	2	4	151	3	42	6	438	0	0	14	633
5909	-	-	1	5	0	0	14	1,031	1	5	0	0	16	1,041
5910	0	0	4	38	1	76	5	272	2	55	0	0	12	441
5911	-	-	-	-	-	-	-	-	-	-	-	-	0	0
5912	-	-	3	38	-	-	-	-	-	-	-	-	3	38
Total	5	39	68	1,892	16	461	53	2,012	25	787	5	183	172	5,374

Table 33. --Sardine larvae--occurrence and abundance by monthly cruise and area, 1960

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken
6001	0	0	6	94	2	13	0	0	2	1,603	9	1,669	19	3,379
6002	0	0	4	39	4	41	1	58	3	75	-	-	12	213
6003	0	0	8	47	4	14	4	20	1	2	-	-	17	83
6004	0	0	3	34	0	0	3	24	1	6	0	0	7	64
6005	0	0	7	340	3	8	0	0	1	7	-	-	11	355
6006	0	0	4	91	1	3	3	24	1	4	-	-	9	122
6007	0	0	3	14	7	49	10	442	3	323	-	-	23	828
6008	-	-	1	51	4	39	6	1,951	4	154	1	15	16	2,210
6009	-	-	-	-	0	0	6	115	-	-	-	-	6	115
6010	0	0	2	5	1	3	8	582	2	53	-	-	13	643
6011	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6012	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	0	0	38	715	26	170	41	3,216	18	2,227	10	1,684	133	8,012

Table 34. --Sardine larvae--occurrence and abundance by cruise and area, 1961

[Station lines given below each area]

	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140		Total	
Cruise	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken
6101-02	0	0	3	71	0	0	2	5	3	145	-	-	8	221
6104-05	0	0	5	66	3	27	0	0	1	3	-	-	9	96
6107	0	0	4	27	2	39	6	379	2	49	-	-	14	494
6110-11	0	0	4	51	1	3	7	270	7	560	1	13	20	897
Total	0	0	16	215	6	69	15	654	13	757	1	13	51	1,708

Table 35. --Sardine larvae--occurrence and abundance by cruise and area, 1962

[Station lines given below each area]

	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140		Total	
Cruise	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken
6201-02	0	0	1	3	2	30	2	36	7	542	0	0	12	611
6203-04	0	0	2	59	2	60	3	32	1	3	0	0	8	154
6207-08	0	0	4	83	2	9	9	967	4	54	-	-	19	1,113
6210-11	0	0	2	5	0	0	8	56	9	319	0	0	19	380
Total	0	0	9	150	6	99	22	1,091	21	918	0	0	58	2,258

Table 36. --Sardine larvae--occurrence and abundance by cruise and area, 1963

[Station lines given below each area]

	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140		Total	
Cruise	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken
6301-02	0	0	1	137	4	267	1	9	1	9	1	8	8	430
6304-05	1	8	0	0	3	19	1	24	1	3	0	0	6	54
6307-08	-	-	3	10	3	170	6	61	1	94	-	-	13	335
6310	-	-	4	39	4	59	7	382	2	50	-	-	17	530
Total	1	8	8	186	14	515	15	476	5	156	1	8	44	1,349

Table 37. --Sardine larvae--occurrence and abundance by cruise and area, 1964

[Station lines given below each area]

	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140		Total	
Cruise	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken
6401-02	0	0	0	0	1	2	1	1	6	1,572	1	33	9	1,608
6404	0	0	0	0	0	0	1	25	1	3	-	-	2	28
6406-07	0	0	1	13	0	0	8	253	3	435	2	29	14	730
6410	-	-	1	2	2	68	3	19	6	302	-	-	12	391
Total	0	0	2	15	3	70	13	298	16	2,312	3	62	37	2,757

Table 38. --Anchovy larvae--monthly cruise summaries of numbers by size, 1951

Cruise	Midpoint of size class (mm.) 3.00	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1]	Total
5101	230	225	247	208	188	123	105	42	26	23	8			2				2	1,429
5102	642	377	562	463	256	172	95	60	44	36	23	22	2	2					2,756
5103	2,848	2,347	1,476	603	269	148	123	71	47	20	12	14	4	6			3	14	8,005
5104	930	257	366	261	189	168	86	103	29	11	10	8	2	7	2			12	2,441
5105	422	121	175	185	286	223	117	102	66	23	18	8	9	10	2	1	2		1,770
5106	350	200	605	1,091	456	153	118	57	42	34	31	18	13	8		2		8	3,186
5107	70	43	67	97	106	92	91	49	41	17	9	2	2	2					688
5108	218	132	286	581	384	219	115	30	76	47	22	8	11	3		2		10	2,144
5109	256	41	94	72	68	34	24	30	16	12	4	2		2				4	659
5110	122	120	123	127	64	60	50	29	26	10	7	9	10	5	3			25	790
5111	754	475	520	598	468	320	188	104	101	46	17	15	14	7	11	5		257	3,900
5112	301	94	250	251	230	144	130	88	77	30	16	11	9	2				148	1,781
Total	7,143	4,432	4,771	4,537	2,964	1,856	1,242	765	591	309	177	117	76	56	18	10	5	480	29,549

Table 39. --Anchovy larvae--monthly cruise summaries of numbers by size, 1952

Cruise	Midpoint of size class (mm.) 2.50	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1]	Total
5201	252	499	337	259	201	42	48	45	36	32	27	22	18	6	18			5	4	1,851
5202	2,303	1,021	437	480	352	241	178	144	92	74	22	11	7	9	6	10	2	2	3	5,394
5203	826	666	968	2,177	2,201	1,726	1,454	869	515	177	103	12	7	8	3	4				11,716
5204	2,061	1,894	1,582	1,042	733	435	348	175	95	71	50	9	10	23	44	13	20	8	13	8,626
5205	470	345	279	525	504	368	213	150	129	159	61	58	84	59	56	56	39	44	32	3,631
5206	3,397	2,653	1,371	1,486	1,613	1,688	668	457	247	158	90	41	45	30	46	30	28	3	11	14,062
5207	71	215	138	203	406	459	226	202	178	135	106	86	26	34	34	1		4	10	2,534
5208	1,121	623	463	358	250	309	163	89	98	24	24	8	10	6		4		7	6	3,563
5209	332	316	665	592	656	509	413	221	131	59	66	33	10	4				2	7	4,016
5210	470	286	165	258	254	399	289	171	42	42	15	14					3		2	2,410
5211	323	438	243	169	205	125	118	122	39	12	13	2	2		2				12	1,825
5212																				-
Total	11,626	8,956	6,648	7,549	7,375	6,301	4,118	2,645	1,602	943	577	296	219	179	209	118	92	75	100	59,628

[1] Disintegrated larvae.

Table 40. --Anchovy larvae--monthly cruise summaries of numbers by size, 1953

Cruise	Midpoint of size class (mm.) 2.50	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1/]	Total
5301	1,864	2,815	5,418	1,063	702	428	322	120	37	28	9	7	2						5	12,820
5302	2,040	2,066	1,618	1,965	2,396	1,979	1,619	1,217	584	358	147	109	39	17	20	10	3	2	12	16,201
5303	1,087	4,221	1,739	1,878	1,878	1,435	997	954	649	378	217	142	71	63	65	21	11	15	21	15,842
5304	999	1,281	1,039	832	643	572	346	259	173	186	123	123	99	63	89	29	18	24	22	6,920
5305	330	688	460	282	234	258	297	244	257	214	73	56	34	5	22	3	5	25	9	3,496
5306	634	1,186	777	538	362	328	311	278	254	94	52	24	14	2	18	7	5			4,884
5307	1,467	736	1,118	810	658	345	261	117	74	28	12	2	2	5					3	5,638
5308	425	330	457	483	385	182	229	148	90	33	10	10	10	6	4				54	2,856
5309	655	425	545	431	300	188	153	105	75	72	14	32	6		3				6	3,010
5310	1,416	1,126	872	732	521	319	250	279	233	132	92	52	37	23	10				3	6,097
5311	1,628	1,377	1,074	1,159	959	648	349	159	75	30	9	2								7,469
5312	2,568	3,202	2,346	1,980	1,437	1,099	630	402	125	65	44	5	10	2	5			2	5	13,927
Total	15,113	19,453	17,463	12,153	10,475	7,781	5,764	4,282	2,626	1,618	802	564	324	186	236	70	42	68	140	99,160

Table 41. --Anchovy larvae--monthly cruise summaries of numbers by size, 1954

Cruise	Midpoint of size class (mm.) 2.50	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1/]	Total
5401	6,430	4,530	4,183	2,595	2,927	1,693	1,008	613	331	196	122	101	66	17	20	6	2	4	16	24,860
5402	5,637	4,793	4,663	4,296	4,181	3,047	2,198	1,381	965	593	465	262	114	57	10	10		2	39	32,713
5403	11,762	6,099	3,726	4,053	3,504	2,292	1,468	619	187	178	130	47	64	49	60	21	1		50	34,310
5404	2,805	3,999	3,708	4,359	4,927	4,234	3,463	2,130	1,450	862	409	150	143	52	80	35	4		34	32,844
5405	1,334	1,100	1,214	1,638	2,183	1,450	1,233	1,138	582	242	120	68	49	42	37	42	17	6		12,495
5406	1,996	1,053	517	632	639	659	384	199	119	97	22	41	21	28	15	13	2	5	55	6,497
5407	1,282	992	792	787	708	665	533	524	561	558	480	261	152	99	67	35	7	12	49	8,564
5408	208	291	233	252	279	175	172	87	50	50	28	18		22		10				1,875
5409																				-
5410	139	91	149	150	195	103	83	97	83	39	21	46	27	3	15	6				1,247
5411																				-
5412	1,735	1,472	718	674	449	278	213	132	78	34	16	6	4	2			3		29	5,843
Total	33,328	24,420	19,903	19,436	19,992	14,596	10,755	6,920	4,406	2,849	1,813	1,000	640	371	304	178	36	29	272	161,248

[1/] Disintegrated larvae.

Table 42. --Anchovy larvae--monthly cruise summaries of numbers by size, 1955

Cruise	Midpoint of size class (mm.)																	Dis.[1]	Total
	2.50	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25		
5501	8,550	10,692	5,072	4,702	3,696	2,612	1,837	1,409	660	386	219	110	77	56	59				7	40,144
5502	4,008	7,470	4,149	4,024	3,359	2,515	1,995	1,285	988	422	218	170	109	31	115	29	20	9	36	30,952
5503	2,970	4,976	3,713	3,838	2,890	2,177	1,703	1,081	748	409	301	117	75	24	14	17		23	6	25,082
5504	894	2,591	1,583	2,407	2,152	2,092	1,806	1,264	822	371	222	169	30	47	15	5	6	3	12	16,491
5505	326	563	348	442	428	432	345	323	279	297	136	95	83	13	47	35	3		6	4,201
5506	1,330	1,622	1,436	1,904	1,855	1,554	1,126	863	446	205	97	28	16	2	39	26		6	102	12,657
5507	1,361	711	506	702	937	866	597	328	268	164	193	118	89	96	97	14	6	5		7,058
5508																				-
5509	34	67	120	87	87	86	109	61	26	19	18	3	3							720
5510	8	31	59	108	78	84	47	62	26	31	9	24	19	20	20	14	4	4		648
5511	87	302	138	216	165	138	36	15	18	26	7						5	3		1,156
5512	138	85	63	111	91	90	90	158	104	63	38	4	22	14	7	5				1,083
Total	19,706	29,110	17,187	18,541	15,738	12,646	9,691	6,849	4,385	2,393	1,458	838	523	303	413	145	44	53	169	140,192

Table 43. --Anchovy larvae--monthly cruise summaries of numbers by size, 1956

Cruise	Midpoint of size class (mm.)																	Dis.[1]	Total
	2.50	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25		
5601	225	885	460	1,205	1,988	1,644	1,130	701	325	198	63	13	3						4	8,844
5602	1,931	3,470	3,438	2,838	4,554	4,579	3,009	1,860	1,474	900	571	221	164	44	52	25			5	29,135
5603	1,140	4,253	2,729	2,163	1,726	1,090	925	936	623	453	283	156	46	70	16	27			3	16,639
5604	3,232	3,300	1,967	2,222	2,182	1,720	2,224	2,565	1,850	835	402	196	75	45	14	19		7		22,855
5605	3,276	2,393	1,146	1,214	932	491	423	584	586	430	180	101	66	37	56	10	7	6		11,938
5606	2,344	4,190	2,838	1,814	2,053	1,604	1,414	898	543	184	141	80	28	23	40	49	8	10		18,261
5607	260	878	1,244	1,739	1,868	2,440	1,844	1,716	1,006	840	369	172	111	29	96	88		14	4	14,718
5608	1,238	1,594	1,267	1,069	1,082	1,221	1,031	484	282	110	126	70	21	11	29					9,635
5609	160	15	29	32	17	22	19	22	37	4			6	11						374
5610	77	134	108	98	98	86	118	46	30	9	6	7	3					6		826
5611	98	92	167	212	189	166	175	116	84	64	17	23	13	3	6					1,425
5612	11	41	71	30	20	41	39	17				6								276
Total	13,992	21,245	15,464	14,636	16,709	15,104	12,351	9,945	6,840	4,027	2,158	1,045	536	273	309	218	15	43	16	134,926

[1] Disintegrated larvae.

Table 44. --Anchovy larvae--monthly cruise summaries of numbers by size, 1957

Cruise	Midpoint of size class (mm.)																	Dis.[1/]	Total
	2.50	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	
5701	654	1,480	1,356	2,413	1,717	998	713	451	348	189	81	32	34	13	11	6			3	10,499
5702	5,518	10,421	9,383	5,776	4,158	3,546	3,274	2,499	1,663	918	558	213	172	85	72				4	48,260
5703	1,604	2,441	2,007	1,591	1,805	1,439	1,390	994	498	202	120	135	18	3	42	22		9	9	14,329
5704	2,079	3,088	2,365	2,469	2,316	2,024	1,779	1,520	981	670	340	215	122	64	120	30	37	9	3	20,231
5705	5,693	2,578	2,235	2,843	2,706	1,783	1,098	764	406	283	131	77	56	51	36	29	15	6	6	20,796
5706	2,969	2,420	1,478	1,726	2,387	2,601	1,971	1,032	626	512	330	145	60	34	61	16	7	3	26	18,404
5707	1,041	748	580	914	1,525	1,534	936	584	274	245	185	111	115	32	28	8		12	13	8,885
5708	166	83	85	70	106	179	275	256	144	56	11	8		3	5					1,447
5709	3			3		7	3	6	3	4									6	35
5710	16	42	60	38	92	180	173	126	80	25	16	3				3	6			860
5711	26	193	344	402	305	268	309	181	145	125	32	3	6	17	3	6			8	2,373
5712	214	146	23	30	9	32	9	11	10	6	11		4		4					509
Total	19,983	23,640	19,916	18,275	17,126	14,591	11,930	8,424	5,178	3,235	1,815	942	587	302	382	120	65	39	78	146,628

[1/] Disintegrated larvae.

Table 45. --Anchovy larvae--monthly cruise summaries of numbers by size, 1958

Cruise	Midpoint of size class (mm.)																	Dis.[1/]	Total
	2.50	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	
5801	4,063	9,608	4,838	3,875	2,757	2,070	1,301	684	382	202	94	37	23	12	12				46	30,004
5802	12,709	15,212	6,322	4,825	4,329	3,076	1,853	969	361	240	131	93	20	22	3	2				50,167
5803	6,546	8,218	6,047	6,871	5,953	4,512	3,495	2,080	1,324	868	483	235	156	70	26					46,884
5804	3,472	3,012	4,760	5,136	4,175	3,610	2,913	2,499	1,975	1,249	829	479	354	174	137	70	18	7	19	34,888
5805	3,486	3,239	2,205	2,592	2,550	2,292	1,976	1,464	1,060	759	472	279	188	144	241	105	17	8		23,077
5806	1,152	1,738	1,366	1,063	873	585	459	382	222	81	54	43	9	16	18	3	16	3		8,083
5807	481	1,065	1,310	1,269	1,245	1,182	1,032	726	582	433	355	206	103	72	85	46	18	6	6	10,222
5808	36	52	36	16	40	63	49		9	9										310
5809	203	295	258	63	42		13	12		6										892
5810	48	73	81	102	93	31	13	30	32	4	8	5							10	530
5811	24	18	5	6	5	5		6	9											78
5812	333	99	57	35	30	20	2	15	5		2									598
Total	32,553	42,629	27,285	25,853	22,092	17,446	13,106	8,867	5,961	3,851	2,428	1,377	853	510	522	226	69	24	81	205,733

[1/] Disintegrated larvae.

Table 46. --Anchovy larvae--monthly cruise summaries of numbers by size, 1959

Cruise	Midpoint of size class (mm.)																		
	2.50	3.75	4.75	5.75	6.75	7.75	8.75	9.75	10.75	11.75	12.75	13.75	14.75	15.75	17.25	19.25	21.25	23.25	Dis.[1]	Total
5901	3,313	3,647	2,043	1,366	921	894	717	399	204	114	64	22	17	21	3				80	13,825
5902	12,182	18,424	3,608	2,869	2,230	1,585	978	588	336	209	159	57	34			5	12		47	43,323
5903	4,990	3,718	1,898	1,566	1,433	1,261	1,059	934	793	538	317	144	62	24	26	20	3	6		18,792
5904	17,149	13,798	11,493	10,779	10,584	8,755	6,374	4,888	3,080	1,423	898	571	297	249	181	71	18		692	91,300
5905	1,993	3,227	2,190	1,766	1,097	926	966	949	884	771	634	537	490	403	377	177	54	12	20	17,473
5906	1,419	1,640	1,890	2,186	1,991	1,607	1,031	695	399	238	209	131	81	52	114	40		6	3	13,732
5907	708	460	512	634	789	830	694	574	442	269	149	123	59	58	92	15		3	8	6,419
5908	48	65	72	81	63	46	38	38	22	27	13	10	10		6	3				542
5909	62	38	32	42	42	35	36	13	3		2				3					308
5910	36	22	9	18	15	15	13	10	14	2			3	3	3	2				165
5911	50	30	22	13	25	15		2	5											162
5912	376	203	39	25	18	9	9	12	9	3	3	3		3						712
Total	42,326	45,272	23,808	21,345	19,208	15,978	11,915	9,102	6,191	3,594	2,448	1,598	1,053	813	805	333	87	27	860	206,753

[1] Disintegrated larvae.

Table 47. --Anchovy larvae--numbers by stations, 1958

Station	Cruise and month											
	5801 Jan.	5802 Feb.	5803 Mar.	5804 Apr.	5805 May	5806 June	5807 July	5808 Aug.	5809 Sept.	5810 Oct.	5811 Nov.	5812 Dec.
43.55	-	-	-	-	-	-	3	-	-	-	-	-
47.50	-	-	-	6	-	-	0	-	-	-	-	-
53.52	-	-	-	-	-	0	4	-	-	-	-	-
57.55	-	-	-	-	-	0	28	-	-	-	-	-
.60	-	-	-	-	-	0	36	-	-	-	-	-
60.52	-	-	-	0	0	0	12	-	-	2	-	-
.55	0	-	-	0	0	0	9	-	-	0	-	-
.60	-	-	-	37	3	0	19	-	-	0	-	-
.65	-	-	-	4	-	-	12	-	-	-	-	-
.70	-	-	-	0	0	6	88	-	-	0	-	-
63.52	166	-	-	9	3	0	0	-	-	0	-	-
.55	-	-	-	-	3	1/ NS	0	-	-	0	-	-
.60	6	-	-	-	0	110	0	-	-	0	-	-
.70	-	-	-	-	0	0	10	-	-	0	-	-
67.50	-	-	-	3	0	0	0	-	-	0	-	-
.55	28	-	-	17	0	43	8	-	-	0	-	-
.60	0	-	-	0	3	343	13	-	-	0	-	-
.70	-	-	-	0	14	0	0	-	-	0	-	-
.80	-	-	-	3	0	0	0	-	-	0	-	-
70.52	-	-	69	40	44	6	54	-	-	-	-	-
.55	-	-	-	6	6	225	2	-	-	15	-	-
.60	-	-	13	84	21	0	0	-	-	0	-	-
.70	0	-	674	7	15	0	22	-	-	3	-	-
.75	-	-	-	0	-	-	149	-	-	-	-	-
.80	0	-	71	0	0	0	125	-	-	0	-	-
.85	-	-	-	0	-	-	6	-	-	-	-	-
73.51	-	-	-	16	3	18	601	-	-	0	-	-
.55	2/ 515a	-	428	0	13	8	166	-	-	0	-	-
.60	35	-	-	0	0	0	48	-	-	0	-	-
.65	-	-	-	3	-	-	3	-	-	3	-	-
.70	-	-	-	0	76	0	14	-	-	0	-	-
.75	-	-	-	3	-	-	137	-	-	-	-	-
.80	-	-	-	2	0	0	3	-	-	0	-	-
.90	-	-	4	0	0	0	-	-	-	0	-	-
77.50	-	-	-	25	24	16	43	-	-	0	-	-
.55	87	-	34	14	65	102	6	-	-	10	-	-
.60	1917	-	13	400	95	68	105	-	-	0	-	-
.65	-	-	-	19	-	-	166	-	-	-	-	-
.70	-	-	-	8	9	12	28	-	-	0	-	-
.75	-	-	-	6	-	-	8	-	-	-	-	-
.90	-	-	45	0	0	0	0	-	-	0	-	-
80.51	576	1,323	589	5	145	8	3	-	-	19	3	87
.55	114	2,409	468	132	16	23	165	-	-	0	3	85
.60	183	692	235	199	15	0	298	-	-	0	6	11
.65	-	-	-	117	-	-	16	-	-	-	-	-
.70	185	432	0	24	3	0	130	-	-	0	-	0
.75	-	-	-	6	-	-	9	-	-	-	-	-
.80	0	7	0	3	50	0	0	-	-	0	-	0
.90	-	3	0	0	9	0	0	-	-	0	-	-
82.47	536	1,392	65	775	545	16	12	-	-	8	2	388
83.40	-	437	266	518	205	5	138	-	-	6	4	0
.43	589	893	1,607	3,094	764	22	378	-	-	12	3	3
.51	160	611	166	1,148	92	84	82	-	-	0	0	10
.55	282	-	748	176	328	51	54	-	-	0	NS	0

See footnotes at end of table.

Table 47.--Anchovy larvae--numbers by stations, 1958--Continued

Station	Cruise and month											
	5801 Jan.	5802 Feb.	5803 Mar.	5804 Apr.	5805 May	5806 June	5807 July	5808 Aug.	5809 Sept.	5810 Oct.	5811 Nov.	5812 Dec.
83.60	55	-	1,242	56	99	62	3	-	-	0	12	8
.65	-	-	-	0	94	0	0	-	-	-	-	-
.70	130	-	0	0	259	0	0	-	-	0	-	-
.75	-	-	-	7	8	0	0	-	-	-	-	-
.80	-	-	7	16	0	0	0	-	-	0	-	-
87.35	433	669	160	497	686	93	0	-	-	124	30	0
.40	158	278	915	1,648	4,286	580	4	-	-	0	2	0
.45	94	1,109	459	1,042	261	266	3	-	-	0	0	0
.50	-	-	436	128	186	74	794	-	-	0	0	0
.55	287	-	113	122	430	20	722	-	-	0	NS	0
.60	90	-	11	55	107	0	36	-	-	0	3	0
.65	-	-	-	96	70	0	12	-	-	-	-	-
.70	0	-	33	4	35	3	0	-	-	0	-	-
.75	-	-	-	3	49	0	0	-	-	-	-	-
.80	0	-	8	3	514	0	0	-	-	0	-	-
.85	-	-	-	-	56	0	0	-	-	-	-	-
90.28	-	1,426	419	355	423	101	208	-	31a	0	0	0
.30	-	155	521	1,255	325	149	158	-	17a	24	0	-
.37	-	NS	226	313	1,132	376	133	-	0	3	0	0
.45	-	58	152	244	74	344	409	-	0	0	3	0
.50	-	110	392	-	244	37	301	-	5a	0	0	0
.55	-	1,045	899	654	72	3	730	-	0	0	0	0
.60	-	22	434	344	116	3	270	-	0	0	0	0
.65	-	-	-	6	315	0	89	-	0	-	-	-
.70	-	13	28	325	1,077	0	[3/] NQ	-	0	0	0	0
.75	-	-	-	234	261	0	0	-	-	-	-	-
.80	0	8	0	NS	0	0	0	-	-	0	0	0
.90	0	4	0	0	0	0	0	-	-	0	-	-
93.27	115	1,552	141	310	14	101	96	-	3a	3	0	0
.30	1,045	179	429	242	96	280	121	-	18a	0	0	0
.35	-	19	343	814	261	367	34	-	26a	0	3	0
.40	92	58	92	240	246	361	120	-	0	0	0	0
.45	-	62	109	NS	1,008	155	96	-	0	0	-	-
.50	139	61	46	99	503	500	340	-	0	0	0	0
.55	-	-	-	14	341	1,983	282	-	0	0	-	-
.60	0	0	108	13	3	255	1,269	-	0	0	0	0
.65	-	-	-	94	11	7	75	-	0	-	-	-
.70	21	NQ	14	3	14	3	0	-	0	0	0	0
.75	-	-	-	NS	7	0	0	-	-	-	-	-
.80	7	0	0	0	0	0	0	-	-	0	0	0
97.30	346	313	463	405	221	33	14	-	-	3	0	0
.32	250	398	1,247	1,350	832	-	88	-	-	0	2	0
.35	-	-	-	623	279	146	6	-	-	0	0	0
.40	9	52	112	1,141	1,294	58	10	-	-	0	0	0
.45	-	172	0	477	138	0	7	-	-	0	-	-
.50	228	0	0	308	18	0	0	-	-	0	0	0
.55	-	-	-	90	18	0	0	-	-	0	-	-
.60	16	0	0	3	0	0	154	-	-	0	0	0
.65	-	-	-	16	0	0	120	-	-	-	-	-
.70	7	15	0	118	0	0	31	-	-	0	-	-
.75	-	-	-	0	3	0	0	-	-	-	-	-
.145	-	-	-	6	-	-	-	-	-	-	-	-
100.29	-	-	-	1,105	545	9	-	-	-	4	2	0
.30	388	982	535	1,658	1,012	-	11	-	-	0	0	0

See footnote at end of table.

Table 47.--Anchovy larvae--numbers by stations, 1958--Continued

Station	Cruise and month											
	5801 Jan.	5802 Feb.	5803 Mar.	5804 Apr.	5805 May	5806 June	5807 July	5808 Aug.	5809 Sept.	5810 Oct.	5811 Nov.	5812 Dec.
100.32	403	77	295	-	-	-	-	-	-	-	-	-
.33	-	-	-	-	-	35	-	-	-	-	-	-
.35	-	-	-	330	1,107	-	3	-	-	0	0	0
.40	115	65	0	26	124	0	0	-	-	0	0	6
.45	-	-	11	0	18	0	0	-	-	0	-	-
.50	7	19	0	NQ	0	9	11	-	-	-	0	0
.55	-	-	-	0	0	0	140	-	-	0	-	-
.60	3	0	0	0	0	0	0	-	-	-	0	0
.75	-	-	-	12	0	0	0	-	-	-	-	-
.80	7	0	0	0	0	0	0	-	-	0	-	-
103.30	19	74	529	308	82	6	0	-	-	-	-	-
.32	-	-	-	-	-	-	-	-	-	10	-	-
.35	19	73	148	190	3	84	13	-	-	0	-	-
.40	5	127	26	7	4	6	0	-	-	3	-	-
.45	-	-	4	27	0	0	2	-	-	4	-	-
.50	28	85	104	242	12	0	0	-	-	0	-	-
.55	-	-	-	10	0	0	0	-	-	0	-	-
.60	0	3	0	0	0	0	0	-	-	0	-	-
.65	-	-	-	0	3	-	0	-	-	-	-	-
.70	0	0	10	0	0	-	0	-	-	0	-	-
107.32	801	73	661	380	0	0	6	-	-	6	-	-
.35	3	36	3,606	436	43	19	11	-	-	NS	-	-
.40	12	16	724	189	44	6	0	-	-	0	-	-
.45	-	-	380	1,482	6	0	0	-	-	0	-	-
.50	0	212	159	151	25	0	0	-	-	0	-	-
.55	-	-	-	70	0	0	0	-	-	0	-	-
.60	0	0	0	11	0	0	0	-	-	5	-	-
.65	-	-	-	4	13	-	0	-	-	-	-	-
.70	0	0	14	0	0	-	0	-	-	0	-	-
110.33	136	1,461	285	208	4	6	0	6	6	27	-	-
.35	821	25	581	152	0	0	0	0	0	5	-	-
.40	806	54	127	15	0	0	0	0	0	5	-	-
.45	-	-	122	185	0	0	0	-	-	0	-	-
.50	37	3	28	526	36	3	0	-	-	0	-	-
.55	-	-	-	867	146	0	0	-	-	0	-	-
.60	22	0	158	0	61	0	0	-	-	0	-	-
.70	6	0	0	0	0	0	0	-	-	0	-	-
.90	0	0	0	6	0	-	-	-	-	0	-	-
113.30	205	96	283	374	0	8	0	0	0	120	-	-
.35	1,444	1,446	1,969	70	0	2	3	0	0	0	-	-
.40	701	3	103	30	0	0	NQ	16	0	2	-	-
.45	-	25	13	14	0	4	0	-	-	0	-	-
.50	0	1,092	10	45	4	0	0	-	-	0	-	-
.55	-	-	-	19	0	0	0	-	-	0	-	-
.60	0	0	0	402	0	0	0	-	-	0	-	-
.65	-	-	-	9	0	0	0	-	-	-	-	-
.70	0	-	0	5	0	0	0	-	-	0	-	-
115.27	-	-	-	-	-	-	-	3	9	-	-	-
.40	-	-	-	-	-	-	-	3	0	-	-	-
117.26	590	868	717	2,268	12	0	3	0	0	50	-	-
.30	134	1,135	228	353	171	3	0	0	3	11	-	-
.35	1,483	2,597	1,769	16	279	3	3	0	0	2	-	-
.40	930	196	5	4	0	14	3	12	0	0	-	-
.45	-	-	0	10	0	0	0	-	-	0	-	-

Table 47. --Anchovy larvae--numbers by stations, 1958--Continued

Station	Cruise and month											
	5801 Jan.	5802 Feb.	5803 Mar.	5804 Apr.	5805 May	5806 June	5807 July	5808 Aug.	5809 Sept.	5810 Oct.	5811 Nov.	5812 Dec.
117.50	10	1,379	0	0	0	0	0	-	-	0	-	-
.55	-	-	-	0	12	0	0	-	-	0	-	-
.60	0	9	14	0	0	0	0	-	-	0	-	-
.70	0	NS	9	0	0	0	0	-	-	0	-	-
118.39	147	2,113	353	48	68	5	0	-	-	0	-	-
118.25	-	-	-	-	-	-	-	0	6	-	-	-
.30	-	-	-	-	-	-	-	6	8	-	-	-
.35	-	-	-	-	-	-	-	0	5	-	-	-
119.33	420	3,856	635	31	18	9	5	10	14	3	-	-
120.25	-	761	468	267	0	0	15	8	3	18	-	-
.30	-	282	1,002	335	0	3	0	56	732	0	-	-
.35	157	2,772	3,238	0	31	0	26	113	3	0	-	-
.40	-	56	32	56	0	0	0	15	NQ	0	-	-
.45	36	239	1,214	51	24	2	0	10	0	0	-	-
.50	0	0	1,528	5	18	0	0	-	-	0	-	-
.55	-	-	-	123	0	0	0	-	-	0	-	-
.60	0	0	207	181	0	0	NQ	-	-	0	-	-
.65	-	-	-	59	0	0	0	-	-	-	-	-
.70	0	0	43	80	0	0	0	-	-	0	-	-
123.37	1,121	1,740	272	77	24	31	0	0	3	0	-	-
.42	109	1,686	65	0	0	9	0	0	0	0	-	-
.45	-	-	-	7	-	-	0	19	NS	0	-	-
.50	4	120	1,895	0	0	3	0	-	-	0	-	-
.60	6	12	11	0	0	0	0	-	-	0	-	-
127.34	1,756	449	507	9	0	0	0	13	0	0	-	-
.40	93	236	3,420	7	9	0	0	0	0	3	-	-
.45	-	373	468	NS	0	NS	0	3	0	0	-	-
.50	0	25	16	0	0	0	0	-	-	0	-	-
.60	0	6	3	6	0	-	0	-	-	NS	-	-
.70	9	-	-	0	-	-	-	-	-	0	-	-
130.30	829	807	420	20	23	113	0	8	0	0	-	-
.35	102	189	0	9	0	0	0	0	0	0	-	-
.40	0	2	3	0	0	0	3	0	0	0	-	-
.45	-	0	10	0	0	0	0	0	0	0	-	-
133.25	6,549	3,680	158	225	10	0	0	9	0	0	-	-
.30	152	1,538	66	363	0	0	0	0	0	0	-	-
.35	-	499	0	-	0	0	0	-	-	0	-	-
.40	0	0	0	8	0	0	13	-	-	0	-	-
.45	-	-	-	5	0	0	0	-	-	0	-	-
.55	-	-	-	6	-	-	0	-	-	0	-	-
137.23	450	440	109	6	28	165	3	0	0	7	-	-
.30	0	18	1,266	0	3	0	0	0	0	0	-	-
.35	0	22	25	6	0	0	0	-	-	0	-	-
.40	0	6	4	0	0	0	0	-	-	0	-	-
140.30	16	0	84	-	-	-	-	-	-	10	-	-
.35	9	27	0	-	-	-	-	-	-	0	-	-
.60	3	-	-	-	-	-	-	-	-	0	-	-
143.26	0	2	353	-	-	-	-	-	-	0	-	-
.40	0	3	0	-	-	-	-	-	-	0	-	-
147.30	0	0	303	-	-	-	-	-	-	0	-	-
.40	0	0	25	-	-	-	-	-	-	0	-	-
Total	30,004	50,167	46,884	34,888	23,077	8,083	10,222	310	892	530	78	598

1/ NS--sample spoiled or spilled.
2/ "a"--first of two or more samples taken at station during cruise.
3/ NQ--sample nonquantitative.

Table 48. --Anchovy larvae--numbers by stations, 1959

Station	Cruise and month											
	5901 Jan.	5902 Feb.	5903 Mar.	5904 Apr.	5905 May	5906 June	5907 July	5908 Aug.	5909 Sept.	5910 Oct.	5911 Nov.	5912 Dec.
60.52	10	-	-	-	0	-	14	-	-	0	-	-
.55	0	-	-	-	0	-	14	-	-	0	-	-
.60	0	-	-	12	27	-	27	-	-	0	-	-
.65	-	-	-	27	0	-	3	-	-	-	-	-
.70	0	-	-	19	0	-	11	-	-	0	-	-
.90	0	-	-	99	0	-	2	-	-	0	-	-
63.52	0	-	-	17	-	-	0	-	-	0	-	-
.55	3	-	-	198	0	-	11	-	-	0	-	-
.60	0	-	-	26	0	-	66	-	-	0	-	-
.65	-	-	-	-	23	-	86	-	-	-	-	-
.80	-	-	-	-	6	-	0	-	-	0	-	-
.90	0	-	-	31	0	-	0	-	-	0	-	-
67.50	2	-	-	12	9	-	6	-	-	0	-	-
.55	22	-	-	5	41	-	6	-	-	0	-	-
.60	0	-	-	110	642	-	17	-	-	0	-	-
.65	-	-	-	-	6	-	0	-	-	-	-	-
.70	0	-	-	-	235	-	0	-	-	0	-	-
.75	-	-	-	-	6	-	0	-	-	-	-	-
.80	-	-	-	-	100	-	0	-	-	0	-	-
.90	0	-	-	0	-	-	4	-	-	0	-	-
70.52	-	-	-	134	3	-	23	-	-	0	-	-
.55	9	-	-	310	53	-	57	-	-	0	-	-
.60	0	-	-	608	52	-	7	-	-	0	-	-
.65	-	-	-	797	-	-	25	-	-	-	-	-
.70	0	-	-	198	-	-	6	-	-	0	-	-
.75	-	-	-	-	25	-	43	-	-	-	-	-
.80	0	-	-	5	7	-	31	-	-	0	-	-
.85	-	-	-	-	14	-	103	-	-	-	-	-
.90	0	-	-	26	0	-	28	-	-	0	-	-
73.51	8	915	-	272	35	-	9	-	-	0	-	-
.53	-	563	-	-	-	-	-	-	-	-	-	-
.55	8	2,060	-	399	6	-	19	-	-	0	-	-
.57	-	187	-	-	-	-	-	-	-	-	-	-
.60	156	356	-	9	22	-	3	-	-	0	-	-
.65	-	-	-	640	17	-	277	-	-	-	-	-
.70	0	82	-	545	51	-	298	-	-	0	-	-
.75	-	-	-	-	6	-	85	-	-	-	-	-
.80	-	-	-	35	9	-	0	-	-	0	-	-
.85	-	-	-	-	6	-	0	-	-	-	-	-
.90	-	-	-	0	3	-	0	-	-	0	-	-
77.50	20	545	-	195	10	3	110	9	-	0	-	-
.53	-	378	-	-	-	-	-	-	-	-	0	3
.55	196	1,459	-	1,120	-	0	243	0	-	0	0	15
.60	12	0	-	966	188	144	71	0	-	0	0	0
.65	-	-	-	3,096	30	131	63	-	-	-	-	-
.70	0	3	-	8	647	104	25	-	-	0	0	21
.75	-	-	-	-	599	-	3	-	-	-	-	-
.80	-	-	-	9	42	136	9	-	-	0	-	-
.85	-	-	-	-	17	121	10	-	-	-	-	-
.90	-	-	-	3	140	26	7	-	-	0	-	-
80.52	278	1/ NS	-	111	24	1,104	340	0	-	0	-	-
.53	-	1,302	-	-	-	-	-	-	-	-	6	36
.55	870	12,234	-	1,614	81	1,092	609	3	-	0	0	0
.57	-	2,157	-	-	-	-	-	-	-	-	-	-
.60	546	930	-	1,930	130	150	250	0	-	0	0	0
.65	-	-	-	1,652	43	74	240	NS	-	-	-	-
.70	14	6	-	804	67	19	6	0	-	0	0	0

See footnote at end of table.

Table 48. --Anchovy larvae--numbers by stations, 1959--Continued

Station	Cruise and month											
	5901 Jan.	5902 Feb.	5903 Mar.	5904 Apr.	5905 May	5906 June	5907 July	5908 Aug.	5909 Sept.	5910 Oct.	5911 Nov.	5912 Dec.
80.75	-	-	-	201	17	23	28	4	-	-	-	-
.80	3	267	-	6	401	0	6	0	-	0	-	-
.85	-	-	-	3	253	27	0	0	-	-	-	-
.90	0	0	-	25	24	216	88	0	-	0	-	-
82.47	220	1,145	-	6	3	12	90	6	-	0	0	22
83.40	428	301	65	2	5	67	13	7	-	0	36	358
.43	80	986	471	45	46	6	65	35	-	3	54	45
.51	314	1,715	NS	1,140	95	72	18	3	-	0	0	0
.55	1,589	1,928	-	1,160	178	134	80	19	-	0	0	0
.60	224	219	-	370	133	320	12	15	-	0	0	0
.65	-	-	-	250	634	101	11	0	-	-	-	-
.70	29	[2] 1,239a	-	11	209	147	22	6	-	0	-	-
.75	-	-	-	36	371	40	20	[3] NQ	-	-	-	-
.80	0	3	-	59	24	0	0	0	-	0	-	-
.85	-	-	-	0	415	0	9	NQ	-	-	-	-
.90	0	0	-	0	6	3	10	0	-	0	-	-
87.35	394	469	570	30	108	102	34	13	-	18	55	16
.40	60	1,096	275	266	64	158	0	0	-	0	3	0
.45	NS	-	543	915	174	4	8	0	-	0	0	0
.50	3	1,263	1,475	552	331	31	17	0	-	0	0	0
.55	137	10	-	69	263	66	57	0	-	0	0	3
.60	279	47	-	70	118	52	0	0	-	0	0	0
.65	-	-	-	558	287	1,185	0	0	-	-	-	-
.70	896	233	-	316	34	154	0	0	-	0	-	-
.75	-	-	-	9	12	42	NS	0	-	-	-	-
.80	0	9	-	6	0	15	0	0	-	0	-	-
.90	0	0	-	0	0	0	3	0	-	0	-	-
90.28	167	241	39	274	818	10	11	0	14	27	0	107
.30	15	8	68	-	-	-	-	-	-	-	3	-
.32	6	45	-	1,504	330	5	0	11	13	0	-	23
.37	0	30	69	187	9	18	0	3	11	0	0	15
.45	0	0	917	1,527	154	479	8	25	0	0	0	12
.50	0	1,014	3,478	820	159	555	NS	3	0	0	0	3
.55	0	0	294	2,088	0	38	2	3	0	0	0	3
.60	9	6	38	1,541	230	4	0	0	0	0	0	8
.65	-	-	0	NS	80	6	0	0	6	-	-	-
.70	0	0	0	6	24	16	0	0	0	0	0	0
.75	-	-	-	0	0	6	0	0	0	-	-	-
.80	0	0	0	3	0	6	0	0	0	0	0	0
.90	0	9	0	0	0	-	0	0	0	0	-	0
93.27	39	-	-	-	-	-	-	-	-	-	-	-
.28	-	0	24	316	476	105	81	6	3	3	3	3
.30	0	0	23	208	102	66	3	0	0	8	2	16
93.35	0	0	45	55	119	62	0	0	0	0	0	3
.40	0	0	140	3,732	32	16	5	0	0	6	0	0
.45	3	66	551	5,806	416	94	54	0	0	0	0	0
.50	3	406	721	1,763	119	464	37	0	0	0	0	0
.55	3	191	182	2,785	122	389	3	3	0	0	0	0
.60	3	5	0	1,068	6	8	0	0	0	0	0	0
.65	-	-	-	192	0	0	0	0	0	-	-	-
.70	0	NS	2	70	0	0	0	0	0	0	0	0
.75	-	-	-	12	3	3	0	0	0	-	-	-
.80	0	0	0	3	0	0	0	0	0	0	0	0
97.30	9	0	16	NQ	57	142	6	0	-	0	-	-
.32	0	0	3	28	59	106	195	0	-	0	-	-
.35	0	8	18	15	39	60	175	0	-	0	-	-
.40	0	13	26	402	609	741	26	3	-	0	-	-

See footnotes at end of table.

Table 48. --Anchovy larvae--numbers by stations, 1959--Continued

Station	Cruise and month											
	5901 Jan.	5902 Feb.	5903 Mar.	5904 Apr.	5905 May	5906 June	5907 July	5908 Aug.	5909 Sept.	5910 Oct.	5911 Nov.	5912 Dec.
97.45	0	0	36	2,843	553	276	12	0	-	0	-	-
.50	0	0	8	649	308	60	0	0	-	0	-	-
.55	17	0	37	NS	130	35	NQ	0	-	0	-	-
.60	14	0	0	64	3	0	0	0	-	0	-	-
.70	0	3	-	0	0	0	0	0	-	0	-	-
100.29	0	0	0	11	42	6	0	38	-	0	-	-
.30	0	2	3	33	81	3	51	20	-	0	-	-
.35	8	0	163	3	3	26	132	0	-	0	-	-
.40	NS	2	62	0	33	294	87	0	-	0	-	-
.45	0	0	0	0	65	22	91	0	-	0	-	-
.50	0	0	0	0	0	40	3	0	-	3	-	-
103.30	0	12	15	60	47	0	0	8	-	0	-	-
.35	8	0	0	1,141	151	49	20	0	-	0	-	-
.40	0	3	0	159	194	3	3	0	-	0	-	-
.45	0	5	0	10	587	54	0	0	-	3	-	-
.50	0	2	0	0	30	0	0	0	-	0	-	-
107.32	14	74	19	206	624	95	17	48	-	0	-	-
.35	39	36	28	1,160	118	19	8	38	-	0	-	-
.40	0	0	8	0	60	137	6	27	-	0	-	-
.45	0	0	0	0	0	218	0	0	-	0	-	-
.50	0	0	47	0	0	21	0	0	-	3	-	-
.55	0	0	3	0	0	0	0	0	-	NS	-	-
110.33	6	136	102	243	227	55	25	0	3	0	-	-
.35	86	32	300	1,297	60	3	0	0	0	0	-	-
.40	0	75	119	62	0	0	0	0	0	0	-	-
.45	0	16	151	16	0	0	3	0	-	0	-	-
.50	0	3	107	8	0	0	0	3	-	0	-	-
.55	0	0	3	0	0	0	0	0	-	0	-	-
.60	0	0	13	3	0	0	0	0	-	0	-	-
.65	-	3	0	0	0	0	0	0	-	-	-	-
.70	2	0	0	0	0	0	0	0	-	0	-	-
.80	0	3	0	0	0	0	0	0	-	0	-	-
113.30	31	123	13	562	83	5	NS	48	6	0	-	-
.35	10	251	30	5,195	278	110	25	3	7	3	-	-
.40	NS	1,213	6	3,450	12	53	0	0	3	0	-	-
.45	2	0	17	3	0	19	0	0	-	3	-	-
.50	6	0	26	0	0	0	0	0	-	0	-	-
.55	0	11	25	2	0	0	0	0	-	3	-	-
.60	0	3	0	2	0	0	0	0	-	0	-	-
.65	-	0	0	2	3	0	0	0	-	-	-	-
.70	0	0	0	0	3	0	0	0	-	0	-	-
.75	-	-	-	0	6	0	0	0	-	-	-	-
115.30	-	-	-	-	-	-	-	-	5	-	-	-
.35	-	-	-	-	-	-	-	-	3	-	-	-
.40	-	-	-	-	-	-	-	-	25	-	-	-
117.26	213	97	350	118	28	0	12	3	3	6	-	-
.30	9	522	147	223	18	26	35	15	13	10	-	-
.35	275	76	499	865	105	33	8	3	0	0		-
.40	0	57	374	17,076	3	57	0	0	3	0	-	-
.45	6	13	140	252	0	124	0	0	-	0	-	-
.50	0	23	69	1,137	0	95	0	0	-	0	-	-
.55	0	8	3	2,398	145	13	0	0	-	0	-	-
.60	0	0	0	550	6	0	0	0	-	0	-	-
.65	-	0	0	146	0	0	0	0	-	-	-	-
.70	0	0	0	0	0	0	3	0	-	0	-	-
118.39	2	3	229	1,430	0	70	12	0	2	0	-	-
118.25	-	-	-	-	-	-	-	-	103	-	-	-

Table 48. --Anchovy larvae--numbers by stations, 1959--Continued

Station	Cruise and month											
	5901 Jan.	5902 Feb.	5903 Mar.	5904 Apr.	5905 May	5906 June	5907 July	5908 Aug.	5909 Sept.	5910 Oct.	5911 Nov.	5912 Dec.
118.30	-	-	-	-	-	-	-	-	10	-	-	-
119.33	234	20	442	232	3	13	3	9	6	3	-	-
120.25	2	32	82	412	93	0	0	0	18	0	-	-
.30	506	38	87	128	3	34	0	0	8	3	-	-
.35	54	29	488	325	2	20	27	0	6	5	-	-
.40	79	17	41	98	53	2	24	8	1	0	-	-
.45	109	98	49	663	349	3	0	0	0	0	-	-
.50	38	26	95	134	65	8	0	0	-	0	-	-
.55	0	2	9	827	3	0	0	0	-	0	-	-
.60	0	0	0	0	0	0	0	3	-	0	-	-
.65	-	3	0	5	0	0	0	0	-	-	-	-
.70	0	0	0	0	0	0	0	0	-	0	-	-
120.26	-	-	-	-	-	-	-	-	13	-	-	-
123.37	159	110	40	-	5	167	0	3	3	0	-	-
.42	0	6a	0	-	42	172	0	0	0	0	-	-
.45	0	0	0	-	0	177	0	NS	0	0	-	-
.50	NS	3	23	-	0	949	0	0	-	0	-	-
.55	NS	0	36	-	0	158	0	0	-	0	-	-
.60	0	0	0	-	0	5	0	0	-	0	-	-
.65	-	-	-	-	0	3	3	0	-	-	-	-
127.34	1,003	6	64	-	30	0	0	9	3	0	-	-
.40	684	0	24	-	55	0	0	3	3	0	-	-
.45	63	267	0	-	954	50	0	0	0	0	-	-
.50	29	35	3	-	0	0	0	0	-	0	-	-
.55	NQ	6	0	-	0	0	0	0	-	0	-	-
.60	0	0	6	-	0	0	0	17	-	0	-	-
.65	-	-	-	-	0	0	3	0	-	-	-	-
130.30	2,143	468	263	28	9	0	21	49	8	19	-	-
.35	0	12	454	0	51	0	0	2	0	0	-	-
.40	0	27	0	23	18	0	0	0	0	0	-	-
.45	0	0	0	23	0	0	25	0	0	0	-	-
.50	0	0	0	8	0	3	24	0	-	0	-	-
.55	0	3	0	0	0	302	0	0	-	0	-	-
.60	0	0	0	0	0	86	0	0	-	0	-	-
.65	-	-	-	-	-	11	0	0	-	-	-	-
133.25	122	305	17	5	33	16	28	-	3	0	-	-
.30	159	78	12	2	19	0	16	3	0	0	-	-
.35	8	8	22	0	3	0	1,186	2	-	0	-	-
.40	0	0	3	0	0	0	0	0	-	0	-	-
.45	0	3	0	0	0	0	31	0	-	0	-	-
.50	0	3	0	0	NS	0	0	0	-	0	-	-
.70	-	-	-	-	-	-	3	0	-	0	-	-
134.36	103	3	15	0	-	0	6	0	0	0	-	-
137.23	300	2,158	2,775	7	79	49	2	0	0	14	-	-
.30	162	548	531	340	8	0	0	NQ	3	12	-	-
.35	0	6	6	25	0	0	0	0	-	10	-	-
.40	3	12	0	0	0	0	0	0	-	0	-	-
.45	0	35	0	0	0	3	0	0	-	0	-	-
140.30	7	-	-	11	-	-	-	1	-	-	-	-
.45	0	-	-	0	-	-	-	2	-	-	-	-
143.26	15	-	-	25	-	-	-	0	-	-	-	-
.30	6	-	-	6	-	-	-	0	-	-	-	-
147.20	0	-	-	42	-	-	-	0	-	-	-	-
.25	8	-	-	0	-	-	-	0	-	-	-	-
.30	14	-	-	0	-	-	-	0	-	-	-	-
Total	13,825	43,323	18,792	91,300	17.473	13,732	6,419	542	308	165	162	712

1/ NS--sample spoiled or spilled.
2/ "a"--first of two or more samples taken at station during cruise.
3/ NQ--sample nonquantitative.

Table 49. --Anchovy larvae--numbers by stations, 1960

[Asterisks indicate sorters' counts]

Station	Cruise and month											
	6001 Jan.	6002 Feb.	6003 Mar.	6004 Apr.	6005 May	6006 June	6007 July	6008 Aug.	6009 Sept.	6010 Oct.	6011 Nov.	6012 Dec.
60.52	0	-	-	0	-	-	2	-	-	0	-	-
.55	0	-	-	0	-	-	1	-	-	0	-	-
.60	0	-	-	0	-	-	73	-	-	0	-	-
.70	0	-	-	0	-	-	8	-	-	0	-	-
63.52	28	-	-	0	-	-	-	-	-	0	-	-
.70	0	-	-	6	-	-	-	-	-	-	-	-
67.70	0	-	-	77	-	-	-	-	-	-	-	-
.80	0	-	-	146	-	-	-	-	-	-	-	-
.90	-	-	-	4	-	-	-	-	-	-	-	-
70.51	3	-	-	-	-	-	-	-	-	-	-	-
.52	-	-	-	8	-	-	-	-	-	-	-	-
.53	3	-	-	-	-	-	2	-	-	0	-	-
.55	11	-	-	0	-	-	0	-	-	0	-	-
.60	0	-	-	1/ NQ	-	-	14	-	-	0	-	-
.70	0	-	-	16	-	-	56	-	-	0	-	-
.80	0	-	-	23	-	-	0	-	-	0	-	-
73.51	0	5	0	18	0	26	-	-	-	0	-	-
.55	0	0	2	NQ	0	85	-	-	-	0	-	-
.60	0	0	0	28	0	61	-	-	-	0	-	-
.70	0	0	8	78	-	-	-	-	-	-	-	-
.90	-	-	-	14	-	-	-	-	-	-	-	-
77.50	0	0	0	-	3	13	-	-	-	3	-	-
.51	1	0	-	5	-	-	-	-	-	0	-	-
.53	2	0	-	-	-	-	-	-	-	-	-	-
.55	15	0	12	82	34	0	-	-	-	0	-	-
.57	14	0	-	-	-	-	-	-	-	-	-	-
.60	0	0	709	NQ	-	104	-	-	-	0	-	-
.65	-	-	-	279	-	37	-	-	-	-	-	-
.70	0	0	0	-	-	291	-	-	-	-	-	-
.75	-	-	-	12	-	-	-	-	-	-	-	-
.80	0	-	-	68	-	-	-	-	-	-	-	-
.90	-	-	-	3	-	-	-	-	-	-	-	-
80.52	72	0	13	189	-	70	23	-	-	5	-	-
.53	33	0	-	269	-	-	-	-	-	-	-	-
.55	8	0	27	132	-	42	3	-	-	5	-	-
.57	2	0	-	-	-	-	-	-	-	-	-	-
.60	0	0	4	598	-	337	0	-	-	0	-	-
.65	-	-	-	567	-	458	0	-	-	0	-	-
.70	0	0	-	354	-	17	0	-	-	0	-	-
.75	-	-	-	21	-	0	-	-	-	-	-	-
.80	0	0	37	371	-	0	0	-	-	0	-	-
.85	-	-	-	52	-	0	-	-	-	-	-	-
.90	0	0	0	0	-	9	0	-	-	0	-	-
82.47	349	3	126	372	0	31	9	-	-	11	-	-
83.40	77	0	9	344	30	10	8	9	-	5	-	-
.43	196	0	67	694	729	19	0	7	-	44	-	-
.51	80	150	516	203	93	42	2	0	-	5	-	-
.55	3	0	-	15	127	5	6	-	-	0	-	-
.60	0	0	53	160	527	181	27	-	-	0	-	-
.65	-	-	-	138	-	213	22	-	-	-	-	-
.70	2	0	45	463	-	966	17	-	-	-	-	-
.75	-	-	-	1,125	-	39	-	-	-	-	-	-
.80	0	0	54	0	-	5	0	-	-	-	-	-

See footnote at end of table.

Table 49. --Anchovy larvae--numbers by stations, 1960--Continued

Station	Cruise and month											
	6001 Jan.	6002 Feb.	6003 Mar.	6004 Apr.	6005 May	6006 June	6007 July	6008 Aug.	6009 Sept.	6010 Oct.	6011 Nov.	6012 Dec.
83.85	-	-	-	0	-	3	-	-	-	-	-	-
87.35	176	83	473	811	393	308	3	42	-	6	-	-
.40	32	481	748	477	102	52	3	39	-	6	-	-
.45	6	70	NQ	333	710	40	0	5	-	22	-	-
.50	1	20	567	206*	319	3	12	0	-	3	-	-
.55	22	0	281	1,579	277	3	13	-	-	0	-	-
.60	16	0	2,272	1,000	330	8	106	-	-	3	-	-
.65	-	-	-	1,096	-	28	20	-	-	-	-	-
.70	0	12	1,184	272	-	11	29	-	-	-	-	-
.75	-	-	-	196	-	611	-	-	-	-	-	-
.80	0	0	0	6	-	2/ NS	0	-	-	-	-	-
.90	4	3	-	2	-	NS	-	-	-	-	-	-
90.28	5	20	345	418	82	33	28	13	-	8	-	-
.32	0	36	33	94	-	103	244	29	-	9	-	-
.37	62	73	954	726	154	0	30	25	-	6	-	-
.45	0	310	1,654	411	389	NQ	0	18	-	3	-	-
.50	10	95	408	2,166	137	0	-	-	-	-	-	-
.53	-	-	-	-	-	-	0	3	-	0	-	-
.55	12	NQ	630	335	198	0	-	-	-	-	-	-
.60	29	3	1,999	1,197	61	0	6	0	-	0	-	-
.65	-	-	-	3,524	483	6	3	-	-	0	-	-
.70	7	0	3	76	834	23	0	0	-	0	-	-
.75	-	-	-	152	553	11	-	-	-	-	-	-
.80	6	9	25	10	99	18	0	0	-	0	-	-
.85	-	-	-	121	165	3	-	-	-	-	-	-
.90	3	0	9	20	8	0	0	0	-	0	-	-
.95	-	-	-	33	0	0	-	-	-	-	-	-
.100	5	0	0	21	0	0	0	0	-	0	-	-
.160	-	-	-	-	-	-	3	-	-	0	-	-
93.28	5	NQ	1,777	416	26	21	306	0	-	0	-	-
.30	6	NQ	1,293	295	47	91	179	19	-	0	-	-
.35	0	829	2,708	1,275	289	53	90	35	-	0	-	-
.40	0	60	220	656	2,318	0	72	0	-	0	-	-
.45	0	494	302	115	299	31	0	-	-	0	-	-
.50	0	742	NS	306	101	67	0	0	-	0	-	-
.55	4	144	6	1,355	473	21	0	-	-	0	-	-
.60	0	0	525	180	777	17	0	0	-	0	-	-
.65	-	-	-	0	1,310	18	3	-	-	0	-	-
.70	0	0	16	115	99	0	0	0	-	0	-	-
.75	-	-	-	6	267	0	-	-	-	-	-	-
.80	0	0	18	54	341	3	0	0	-	0	-	-
.85	-	-	-	27	40	14	-	-	-	-	-	-
.90	0	0	0	0	17	0	0	0	-	0	-	-
.95	-	-	-	0	24	0	-	-	-	0	-	-
.100	-	5	0	0	3	6	0	0	-	0	-	-
97.30	5	224	243	56	12	0	74	37	-	0	-	-
.32	0	473	669	822	12	327	52	24	-	0	-	-
.35	0	223	143	426	6	75	27	2	-	3	-	-
.40	32	912	706	NS	9	88	30	18	-	0	-	-
.45	0	372	NS	719	63	55	3	-	-	0	-	-
.50	0	89	1,060	1,570	100	69	20	-	-	0	-	-
.55	0	350	583	2,684	2,589	20	3	-	-	-	-	-
.60	0	16	5	12	15	3	3	-	-	-	-	-
.70	0	0	0	9	-	0	0	-	-	-	-	-

See footnote at end of table.

Table 49. --Anchovy larvae--numbers by stations, 1960--Continued

Station	Cruise and month											
	6001 Jan.	6002 Feb.	6003 Mar.	6004 Apr.	6005 May	6006 June	6007 July	6008 Aug.	6009 Sept.	6010 Oct.	6011 Nov.	6012 Dec.
97.75	-	-	-	3	-	0	-	-	-	-	-	-
.80	2	0	0	0	-	0	0	-	-	-	-	-
.85	-	-	-	0	-	110	-	-	-	-	-	-
.90	0	0	0	0	-	3	-	-	-	-	-	-
100.29	458	284	942	647	-	0	-	5	-	-	-	-
.30	44	1,117	150	725	-	8	3	0	-	3	-	-
.35	6	2,664	1,361	2,348	-	0	27	76	-	0	-	-
.40	0	575	822	436	-	3	3	12	-	0	-	-
.45	38	220	717	159	-	24	6	-	-	0	-	-
.50	16	5	384	329	-	63	31	-	-	0	-	-
.55	0	52	188	324	-	3	0	-	-	0	-	-
.60	3	0	0	67	-	3	NQ	-	-	0	-	-
.65	-	-	-	54	-	0	0	-	-	0	-	-
.70	0	0	0	2	-	0	0	-	-	0	-	-
.75	-	-	-	26	-	0	-	-	-	-	-	-
.80	0	0	0	2	-	0	0	-	-	0	-	-
103.30	848	327	1,026	263	62	-	52	8	0	0	-	-
.35	13	1,688	1,643	445a	112	-	0	0	0	0	-	-
.40	0	756	1,495	504	392	3	0	0	0	0	-	-
.45	3	823	17	496	270	9	3	-	-	-	-	-
.50	0	2	155	235	182	5	0	-	-	-	-	-
.55	0	0	55	250	208	0	0	-	-	-	-	-
.60	0	14	NS	93	529	0	0	-	-	-	-	-
.65	-	-	-	9	62	0	0	-	-	-	-	-
107.32	556	890	3,404	384	2	51	14	41	0	0	-	-
.35	39	1,135	2,623	1,095	70	18	12	0	0	0	-	-
.40	10	535	1,135	182	64	50	0	0	0	0	-	-
.45	258	2	356	25	0	50	31	-	-	-	-	-
.50	48	9	21	11	3	2	14	-	-	-	-	-
.55	20	0	134	14	59	18	0	-	-	-	-	-
.60	8	0	12	46	18	3	0	-	-	-	-	-
.65	-	-	-	40	0	0	0	-	-	-	-	-
.70	0	0	0	28	23	0	0	-	-	-	-	-
.75	-	-	-	0	3	0	-	-	-	-	-	-
.80	0	0	0	3	0	0	0	-	-	-	-	-
.85	-	-	-	2	-	-	-	-	-	-	-	-
110.33	30	280	250	648	82	7	39	0	8	2	-	-
.35	156	1,109	1,141	656	306	30	21	0	0	5	-	-
.40	848	747	456	46	94	0	16	0	0	0	-	-
.45	210	6	39	1,085	285	3	0	-	-	0	-	-
.50	498	2	6	899	3	0	0	-	-	0	-	-
.55	0	0	17	38	0	0	0	-	-	0	-	-
.60	0	23	27	16	6	0	0	-	-	0	-	-
.65	-	-	-	5	0	0	0	-	-	0	-	-
.70	0	0	0	16	0	0	6	-	-	0	-	-
.75	-	-	-	3	0	0	-	-	-	-	-	-
.80	0	0	0	31	3	0	0	-	-	0	-	-
.85	-	-.	-	9	-	-	-	-	-	-	-	-
.90	0	0	0	2	-	-	0	-	-	0	-	-
113.30	71	4	7	16	0	0	7	14	8	8	-	-
.35	108	782	4,932	67	3	3	3	16	6	3	-	-
.40	73	1,134	1,227	1,705	0	0	6	111	0	3	-	-
.45	68	406	250	2,302	49	0	0	-	-	-	-	-
.50	14	19	48	172	20	0	22	-	-	-	-	-

Table 49. --Anchovy larvae--numbers by stations, 1960--Continued

Station	Cruise and month											
	6001 Jan.	6002 Feb.	6003 Mar.	6004 Apr.	6005 May	6006 June	6007 July	6008 Aug.	6009 Sept.	6010 Oct.	6011 Nov.	6012 Dec.
113.55	3	24	166	0	51	0	76	-	-	-	-	-
.60	0	0	38	53	34	0	0	-	-	-	-	-
.65	-	-	-	86	3	0	0	-	-	-	-	-
.70	0	0	3	25	0	0	0	-	-	-	-	-
.75	-	-	-	6	0	0	-	-	-	-	-	-
.80	0	0	0	128	0	0	0	-	-	-	-	-
.85	-	-	-	12	-	-	-	-	-	-	-	-
115.27	-	-	-	-	-	-	-	-	14	-	-	-
.30	-	-	-	-	-	-	-	-	3	-	-	-
.35	-	-	-	-	-	-	3	-	0	8	-	-
.40	-	-	-	-	-	-	-	-	5	-	-	-
117.26	93	2	138	65	22	0	0	11	20	30	-	-
.30	74	38	561	1,484	71	0	20	0	70	27	-	-
.35	125	316	75	5,073	6	10	0	0	0	3	-	-
.40	194	278	997	920	14	0	17	0	3	0	-	-
.45	320	530	6,622	2,063	19	56	0	-	-	-	-	-
.50	377	180	4,500	1,121	0	30	3	-	-	-	-	-
.55	11	394	3,386	2	6	0	0	-	-	-	-	-
.60	0	435	757	24	0	0	0	-	-	-	-	-
.65	-	-	-	254	3	0	0	-	-	-	-	-
.70	0	0	2,692	862	0	0	0	-	-	-	-	-
.75	-	-	-	28	0	0	-	-	-	-	-	-
.80	0	0	0	0	0	0	3	-	-	-	-	-
.85	-	-	-	2	-	-	-	-	-	-	-	-
.90	3	-	-	0	-	-	-	-	-	-	-	-
118 39	470	175	368	2,275	11	34	82	0	-	3	-	-
118.25	-	-	-	-	-	-	-	-	3	-	-	-
.30	-	-	-	-	-	-	-	-	24	-	-	-
119.33	313	47	328	92	48	86	25	38	5	23	-	-
120.25	69	13	664	76	51	35	57	102	2	0	-	-
.30	233	66	181	42	30	501	48	26	0	3	-	-
.35	528	323	63	12	2	807	9	11	0	118	-	-
.40	320	1,408	818	21	4	66	35	0	0	2	-	-
.45	251	463	490	192	0	43	3	12	-	0	-	-
.50	36	320	1,990	160	0	7	9	-	-	0	-	-
.55	459	188	2,556	47	0	0	0	-	-	0	-	-
.60	0	128	4,050	72	516	0	0	-	-	3	-	-
.65	-	-	-	38	170	0	0	-	-	0	-	-
.70	0	15	1,198	9	6	0	0	-	-	6	-	-
.75	-	-	-	0	5	0	-	-	-	-	-	-
.80	0	0	34	0	0	0	0	-	-	3	-	-
.90	0	0	3	0	-	-	0	-	-	0	-	-
123.37	650	91	153	2	10	0	2	0	-	0	-	-
.42	329	592	1,031	283	45	0	9	0	-	0	-	-
.45	1,509	607	1,748	131	317	0	-	5	-	3	-	-
.50	29	1,667	676	38	618	0	0	-	-	0	-	-
.55	3	54	375	5	463	0	3	-	-	-	-	-
.60	260	100	1,203	0	34	0	0	-	-	-	-	-
.65	-	-	-	7	-	-	-	-	-	-	-	-
.70	104	-	-	0	-	-	-	-	-	-	-	-
.80	50	-	-	0	-	-	-	-	-	-	-	-
127.34	486	380	2,302	78	0	8	2	2	-	0	-	-
.40	11	78	2,391	94	25	8	14	0	-	0	-	-

Table 49. --Anchovy larvae--numbers by stations, 1960--Continued

Station	Cruise and month											
	6001 Jan.	6002 Feb.	6003 Mar.	6004 Apr.	6005 May	6006 June	6007 July	6008 Aug.	6009 Sept.	6010 Oct.	6011 Nov.	6012 Dec.
127.45	6	515	322	12	8	3	3	-	-	0	-	-
.50	0	164	195	8	3	0	0	-	-	0	-	-
.55	0	3	24	0	0	0	0	-	-	-	-	-
.60	0	2	0	0	0	0	0	-	-	-	-	-
130.30	1,557	376	638	14	0	3	0	0	-	0	-	-
.35	1,267	1,168	1,982	0	37	3	0	34	-	0	-	-
.40	91	3,228	100	13	3	0	0	5	-	0	-	-
.45	17	17	88	45	14	0	0	-	-	0	-	-
.50	9	12	140	5	0	0	6	-	-	0	-	-
.55	0	6	234	330	0	0	0	-	-	0	-	-
.60	0	NQ	68	31	0	0	0	-	-	0	-	-
133.25	1,951	614	159	239	28	199	15	8	-	-	-	-
.30	1,361	3,684	70	81	48	260	123	9	-	-	-	-
.35	1,049*	351	227	288	0	64	5	-	-	-	-	-
.40	307	2,062	616	0	3	161	0	-	-	-	-	-
.45	428	455	280	3	-	-	0	-	-	-	-	-
.50	16	54	532	6	-	-	0	-	-	-	-	-
.55	0	-	-	6	-	-	0	-	-	-	-	-
.60	0	-	-	57	-	-	0	-	-	-	-	-
134.36	73	3,873	243	245	3	28	0	-	-	-	-	-
137.23	2,160	485	1,262	29	105	422	1,051	3	-	40	-	-
.30	9,579	801	304	9	87	958	0	10	-	0	-	-
.35	1,560	21	52	0	30	65	0	-	-	0	-	-
.40	70	93	19	3	3	15	0	-	-	0	-	-
.45	8	59	0	0	-	-	0	-	-	0	-	-
.50	0	0	0	5	-	-	0	-	-	0	-	-
.55	0	-	-	6	-	-	0	-	-	0	-	-
.60	0	-	-	5	-	-	0	-	-	0	-	-
140.30	468	-	-	79	-	-	-	1	-	-	-	-
.35	15	-	-	3	-	-	-	-	-	-	-	-
.40	106	-	-	0	-	-	-	-	-	-	-	-
.45	5	-	-	0	-	-	-	-	-	-	-	-
143.26	294	-	-	0	-	-	-	0	-	-	-	-
.30	490	-	-	0	-	-	-	-	-	-	-	-
.35	209	-	-	0	-	-	-	-	-	-	-	-
.40	529	-	-	0	-	-	-	-	-	-	-	-
.45	165	-	-	0	-	-	-	-	-	-	-	-
.50	6	-	-	0	-	-	-	-	-	-	-	-
.55	0	-	-	3	-	-	-	-	-	-	-	-
.60	3	-	-	5	-	-	-	-	-	-	-	-
147.20	128	-	-	0	-	-	-	-	-	-	-	-
.25	867	-	-	0	-	-	-	-	-	-	-	-
.30	3	-	-	0	-	-	-	-	-	-	-	-
.35	0	-	-	6	-	-	-	-	-	-	-	-
150.19	18	-	-	0	-	-	-	-	-	-	-	-
.30	2	-	-	0	-	-	-	-	-	-	-	-
.35	5	-	-	0	-	-	-	-	-	-	-	-
.50	0	-	-	3	-	-	-	-	-	-	-	-
153.20	12	-	-	0	-	-	-	-	-	-	-	-
.60	0	-	-	3	-	-	-	-	-	-	-	-
Total	37,937	48,871	98,693	67,701	21,940	9,645	3,574	885	171	443	-	-

1/ NQ--sample nonquantitative.
2/ NS--sample spoiled or spilled.

Table 50. --Anchovy larvae--numbers by stations, 1961-62

[Asterisks indicate sorters' counts]

Station	Cruise and month							
	6101-02 Jan.-Feb.	6104-05 Apr.-May	6107 July	6110-11 Oct.-Nov.	6201-02 Jan.-Feb.	6203-04 Mar.-Apr.	6207-08 July-Aug.	6210-11 Oct.-Nov.
60.52	0	0	0	0	4	0	-	0
.55	0	0	0	0	6	0	-	3
.60	0	0	0	0	0	3	-	0
.70	0	0	67	0	-	0	-	0
63.52	4	0	0	0	0	9	-	3
.55	0	0	0	0	0	31	-	9
.60	0	0	3	0	0	89	-	17
67.50	0	0	0	8	0	187	-	0
.55	2	0	22	10	0	31	-	0
.60	0	0	304	0	0	12	-	0
70.53	0	0	54	0	0	1,460	-	30
.55	4	0	130	8	0	-	-	-
.60	0	0	668	34	0	23	-	-
.70	0	0	121	9	0	0	-	3
.90	0	0	0	0	0	0	-	3
.100	0	0	0	2	0	0	-	-
73.53	0	0	10	7	0	0	-	3
.60	0	13	369	0	0	4	-	3
77.51	7	7	4	3	118	72	-	0
.55	0	3	18	12	3	0	-	3
.57	0	34	102	0	2	0	-	0
80.52	12	203	38	15	57	0	-	73
.53	-	-	-	-	-	-	51	-
.55	24	594	52	0	64	11	-	0
.60	0	176	1,024	13	0	8	8	6
.65	0	55	284	21	0	30	-	0
.70	0	278	334	0	0	6	0	0
.80	0	1,308	22	0	0	133	0	0
.90	0	34	0	0	0	75	0	0
.100	0	98	4	0	0	0	0	0
.120	0	11	0	0	0	0	0	0
82.47	0	0	3	5	13	91	215	24
83.40	0	118	31	1	0	6	45	13
.43	9	75	9	0	3	758	356	102
.51	0	14	532	8	40	616	118	3
.55	0	84	50	18	8	188	11	0
.60	0	13	825	6	0	326	6	0
.65	0	27	2,534	6	0	241	22	0
.70	0	178	1,009	3	0	96	22	0
.80	0	718	199	0	0	39	8	0
.90	-	105	0	0	0	189	3	0
87.35	0	199	772	5	19	1,059	211	6
.40	3	83	52	3	108	1,139	611	4
.45	0	285	0	3	84	245	320	12
.50	0	153	0	2	11	268	18	26
.55	6	152	9	0	6	559	44	30
.60	0	142	176	0	0	4,045	0	15
.65	0	85	132	0	9	719	13	2
.70	0	246	229	5	0	1,545	0	5
.80	0	339	0	0	0	1,610	24	0
.90	-	9	0	0	0	0	3	0
90.28	4	275	128	7	0	520	0	2
.30	-	-	-	-	-	-	23	-
.32	3	213	0	4	2,612	2,916	-	0
.37	0	879	0	0	605	4,109	-	0
.40	-	-	-	-	-	-	302	-

Table 50. --Anchovy larvae--numbers by stations, 1961-62--Continued

Station	Cruise and month							
	6101-02 Jan.-Feb.	6104-05 Apr.-May	6107 July	6110-11 Oct.-Nov.	6201-02 Jan.-Feb.	6203-04 Mar.-Apr.	6207-08 July-Aug.	6210-11 Oct.-Nov.
90.45	0	209	0	0	230	614	-	3
.53	0	183	8	2	9	1,647	-	0
.60	0	84	31	0	2	196	0	0
.65	0	307	82	0	5	403	-	0
.70	0	253	24	0	6	933	0	0
.80	0	32	0	0	0	101	0	0
.90	0	174	0	0	0	0	0	0
.100	0	1,325	0	0	0	0	3	0
.140	0	0	0	0	0	0	2	0
93.28	120	98	23	0	512	3,884	356	138
.30	55	342	0	6	471	2,012	1,070	85
.35	3	164	0	0	485	2,587	388	0
.40	11	564	0	0	893	592	594	3
.45	3	143	3	13	924	798	52	0
.50	0	64	128	0	214	888	15	0
.55	0	47	9	0	97	1,212	21	0
.60	0	150	0	0	947	3,596	26	0
.65	0	578	0	0	0	1,721	132	0
.70	0	275	0	0	0	4,390	11	0
.80	0	114	6	0	0	1,582	2	9
.90	0	0	19	0	0	3	0	0
.100	0	0	0	0	0	3	0	0
97.30	72	75	198	15	90	1,252	29	22
.32	120	458	8	0	900	194	2	3
.35	20	595	0	0	285	619	0	0
.40	47	292	0	3	226	251	29	0
.45	29	487	0	0	2,457	4,290	12	17
.50	64	290	3	0	601	1,259	3	3
.55	-	91	0	0	48	329	3	3
.60	3	31	30	0	32	258	0	0
.65	0	125	24	0	0	260	0	0
.70	0	19	0	0	0	19	0	0
.80	0	28	0	0	0	9	0	0
.90	-	4	0	0	0	21	0	0
100.30	32	7	120	9	215	2,536	0	26
.35	16	1,720	14	0	215	714	31	11
.40	9	905	0	0	231	4,419	0	0
.45	66	90	0	0	50	2,791	0	0
.50	96	279	2	0	301	1,917	0	0
.55	9	116	0	0	0	14	0	0
.60	0	5	0	0	0	0	0	0
.65	0	5	0	0	0	9	0	0
.70	0	0	0	0	0	196	0	0
.80	0	4	0	0	5	21	0	0
.90	0	77	0	0	0	104	0	0
.100	0	0	0	0	0	8	-	0
.120	0	0	0	0	3	0	-	0
103.30	25	6	27	4	954	301	18	53
.35	126	475	8	0	329	247	22	17
.40	25	31	0	0	203	711	23	0
.45	127	17	0	0	86	15	0	6
.50	0	29	0	0	6	3	0	0
.55	0	6	0	0	0	6	0	0
.60	0	9	0	3	0	0	0	0
.65	0	6	0	0	0	0	0	0
.70	0	143	0	3	3	8	0	0

Table 50. --Anchovy larvae--numbers by stations, 1961-62--Continued

Station	Cruise and month							
	6101-02 Jan.-Feb.	6104-05 Apr.-May	6107 July	6110-11 Oct.-Nov.	6201-02 Jan.-Feb.	6203-04 Mar.-Apr.	6207-08 July-Aug.	6210-11 Oct.-Nov.
103.80	0	11	0	0	0	2	0	0
.90	-	6	0	0	0	-	0	0
107.32	316	193	44	20	211	1,112	4	0
.35	319	6	0	6	165	818	0	0
.40	24	21	5	0	146	420	0	0
.45	0	3	0	3	704	102	0	3
.50	0	17	0	0	31	399	0	0
.55	0	20	0	0	5	3	3	0
.60	0	56	0	0	101	5	0	0
.65	0	41	0	0	3	0	0	0
.70	0	30	0	0	0	0	3	0
.80	0	5	0	0	0	0	0	0
110.32	-	-	-	-	-	623	7	0
.33	1,089	5	8	17	157	-	-	-
.35	243	8	6	0	52	491	25	3
.40	5	224	0	0	175	246	0	0
.45	642	1,802	0	0	344	44	0	0
.50	82	85	0	0	17	220	0	0
.55	10	65	0	0	0	0	0	0
.60	10	93	0	3	3	0	0	0
.65	0	14	0	0	59	10	12	0
.70	0	22	0	0	0	0	7	0
.80	0	45	0	0	0	0	0	0
113.30	39	5	0	3	450	101	2	0
.35	114	442	16	3	159	267	0	0
.40	81	69	0	3	202	24,135	3	0
.45	52	289	0	0	348	1,511	5	12
.50	6	13	0	0	0	204	0	2
.55	36	21	0	0	0	9	0	0
.60	52	49	0	0	141	0	0	0
.65	0	99	0	0	48	6	0	0
.70	0	8	0	0	33	12	0	0
.80	0	0	0	0	3	0	0	0
.90	-	0	0	0	0	3	0	0
115.35	436	-	7	-	172	640	0	9
117.26	0	7	8	6	64	1,396	0	8
.30	2,732	8	14	3	43	7,102	4	2
.35	427	862	96	0	6	619	42	3
.40	818	832	0	12	1,164	622	164	8
.45	64	54	0	3	1,606	1,984	0	0
.50	0	79	0	0	1,549	700	0	0
.55	3	331	0	0	178	0	0	0
.60	9	46	0	0	0	0	8	0
.65	6	497	0	0	0	2	10	0
.70	0	33	0	0	0	6	0	0
.80	0	8	0	0	0	18	0	0
118.39	535	73	0	28	328	1,354	190	37
119.33	68	-	0	4	30	880	337	93
120.25	149	48	6	4	778	1,444	328	2
.30	121	32	14	0	171	4,006	158	99
.35	110	21	39	0	513	327	530	83
.40	153	1/ 35*a	2a	5	233	910	6	119
.45	0	5,112	0	6	997	46	5	0
.50	0	813	0	11	941	1,186	0	0
.55	11	2,040	0	3	1337	145	0	0
.60	0	631	0	0	0	3	0	0

See footnote at end of table.

Table 50.--Anchovy larvae--numbers by stations, 1961-62--Continued

Station	Cruise and month							
	6101-02 Jan.-Feb.	6104-05 Apr.-May	6107 July	6110-11 Oct.-Nov.	6201-02 Jan.-Feb.	6203-04 Mar.-Apr.	6207-08 July-Aug.	6210-11 Oct.-Nov.
120.65	0	164	0	0	3	21	0	0
.70	0	37	0	0	0	25	0	0
.80	0	12	0	0	0	56	0	0
.90	0	21	0	0	0	32	0	0
.100	0	2	0	0	0	0	-	0
123.37	2,062	3	0	3	1,567	529	39	11
.42	1,667	144	0	11	2,285	14	3	0
.45	51	199	0	6	556	46	0	0
.50	0	180	0	3	975	95	0	0
.55	3	77	0	0	260	787	0	0
.60	0	29	0	0	298	190	0	0
.65	-	11	0	0	13	44	0	0
.70	-	8	0	0	29	71	0	0
.80	-	84	0	0	8	41	0	0
127.34	374	284	0	2	314	0	94	5
.40	1,043	1,034	3	9	78	112	69	3
.45	791	126	0	0	49	299	10	11
.50	201	0	20	0	242	401	118	0
.55	60	0	0	0	190	157	48	0
.60	265	0	0	0	77	41	2	0
.65	-	0	0	0	1,364	19	0	0
.70	-	26	0	0	0	9	0	0
.80	-	7	0	0	0	32	0	0
130.30	2,251	18	29	25	3	5	22	555
.35	1,620	770	6	2	2,108	11	0	0
.40	767	173	0	0	8,809	43	0	0
.45	0	3	3	0	1,920	302	0	0
.50	0	168	0	0	576	516	0	0
.55	0	0	0	0	539	237	0	0
.60	0	16	0	0	0	34	0	0
.70	0	22	0	0	0	5	0	0
133.25	2/ NQ	0	0	0	1,911	304	0	15
.30	4,236	0	0	0	2,918	16	-	0
.35	2,825	3	19	8	1,905	202	-	0
.40	34	107	10	0	723	107	-	0
.45	0	621	0	0	169	157	-	0
.50	0	127	3	0	32	140	-	0
.55	0	99	0	0	13	364	-	0
.60	0	12	0	0	0	28	-	0
.65	-	0	0	0	0	9	-	0
.70	-	0	0	0	0	46	-	0
.80	-	0	0	0	0	3	-	0
137.23	2,476	0	4	0	5,792	4	-	0
.30	11,463*	0	0	0	911	168	-	0
.35	2,154*	0	0	0	2,095	117	-	0
.40	2,027*	0	0	0	21	3	-	0
.45	186*	0	0	0	0	5	-	0
.50	31*	0	0	0	0	3	-	0
.55	2*	0	0	0	3	0	-	0
.80	3*	0	0	0	0	3	-	0
140.30	-	-	-	3	1,115	20	-	5
.35	-	-	-	0	76	148	-	0
.40	-	-	-	0	3	190	-	0
.45	-	-	-	0	52	5	-	3
.50	-	-	-	0	0	13	-	0
Total	46,510	38,653	11,449	491	69,476	133,773	7,536	1,890

1/ "a"--first of two or more samples taken at station during cruise.
2/ NQ--sample nonquantitative.

Table 51.--Anchovy larvae--numbers by stations, 1963-64

[Asterisks indicate sorters' counts]

Station	Cruise and month							
	6301-02 Jan.-Feb.	6304-05 Apr.-May	6307-08 July-Aug.	6310 Oct.	6401-02 Jan.-Feb.	6404 Apr.	6406-07 June-July	6410 Oct.
60.55	0	5	-	-	3	0	0	-
.60	9*	5	-	-	6	0	0	-
.70	0	5	-	-	0	0	0	-
.90	0	19	-	-	0	-	0	-
.100	0	6	-	-	0	-	0	-
63.52	2*	16	-	-	24	3	2*	-
.55	0	106	-	-	35	0	1/ NS	-
.60	0	14	-	-	0	3	12*	-
67.50	0	266	-	-	80	0	12*	-
.55	0	57	-	-	53	0	59*	-
.60	0	106	-	-	0	0	0	-
.65	-	-	-	-	-	8	-	-
70.51	-	148	-	-	142	0	0	-
.53	2*	1,053	-	-	693	15	12*	-
.60	3*	275	-	-	0	2,768	0	-
.65	-	-	-	-	-	21	-	-
.70	0	82	-	-	0	33	11*	-
.80	0	0	-	-	0	0	40*	-
73.53	0	199	-	-	606	283	8	-
.60	0	681	-	-	0	2,780	906	-
.65	-	-	-	-	-	1,374	-	-
.70	-	-	-	-	-	510	-	-
77.51	0	370	-	-	303	58	3	-
.55	0	160	-	-	911	391	215	-
.57	0	192	-	-	598	750	-	-
.60	-	-	-	-	306	1,026	98	-
.65	-	-	-	-	-	603	36	-
.70	-	-	-	-	33	219	449	-
.80	-	-	-	-	-	32	-	-
80.52	22	950	25	22	145	42	2	0
.55	6	605	71	19	349	1,745	6	0
.60	3	225	0	34	708	1,699	1,610	0
.65	0	268	11	26	99	1,809	1,919	0
.70	0	5,763	149	0	3	55	329	0
.75	0	-	-	-	16	-	369	-
.80	0	1,614	0	0	22	130	0	0
.90	0	697	0	0	0	-	0	0
.100	0	214	-	-	0	-	0	-
.120	0	12	-	-	0	-	-	-
82.47	20	125	44	24	1,189	372	259	13*
83.40	81	29	163	125	893	57	20	74*
.43	129	265	280	245	399	1,513	279	179*
.51	82	111	293	223	362	1,313	152	3*
.55	189	164	121	16	704	162	222	16*
.60	24	1,960	23	0	107	453	59	0
.65	13	1,728	0	0	202	70	295	0
.70	43	3,056	8	0	223	40	54	0
.75	6	-	-	-	-	-	-	-
.80	9	1,735	0	0	0	0	22	3*
.85	13	-	-	-	-	-	-	-
.90	4	271	3	0	5	-	0	0
.95	5	-	-	-	-	-	-	-
.105	6	-	-	-	-	-	-	-
.115	3	-	-	-	-	-	-	-
87.35	3,752*	402	6	27*	386*	2,349	36*	191*
.40	3,099*	357	0	3*	2,781*	2,944	31*	171*
.45	2,647*	500	17	11*	962*	1,030	80*	628*
.50	68*	404	7	48*	2/ NQ	4,130	212*	252*

See footnotes at end of table.

Table 51. --Anchovy larvae--numbers by stations, 1963-64--Continued

Station	Cruise and month							
	6301-02 Jan.-Feb.	6304-05 Apr.-May	6307-08 July-Aug.	6310 Oct.	6401-02 Jan.-Feb.	6404 Apr.	6406-07 June-July	6410 Oct.
87.55	37*	381	373	0	536*	1,123	155*	7*
.60	56*	1,217	458	56*	121*	1,294	639*	0
.65	818*	3,411	0	0	1,288*	50	847*	0
.70	0	2,738	5	0	8,820*	805	66*	0
.80	0	398	0	0	0	2,423	9*	0
.90	0	143	0	0	0	0	0	0
90.28	2,003*	103	0	58*	696*	447	126*	17*
.32	1,724*	66	0	82*	409*	552	152*	196*
.37	1,602*	437	0	53*	197*	1,454	14*	436*
.45	218*	1,123	103	0	707*	1,049	98*	15*
.53	39*	1,543	236	0	43*	0	60*	3*
.60	132*	538*	18	0	2*	44	135*	0
.65	375*	1,239	410	0	45*	14	243*	0
.70	0	503	36	0	5*	624	448*	3*
.80	3*	16	0	0	0	1,063	0	0
.90	0	41*	12	3*	0	165	0	0
.100	0	0	-	-	0	20	0	0
.180	0	6*	-	-	0	-	0	-
93.28	1,975*	472*	0	21*	3,376*	1,601	16*	181*
.30	2,265*	202*	6	3*	1,537*	3,030	18*	265*
.35	364*	1,225	3	15*	852*	2,485	0	0
.40	286*	361*	31	3*	670*	225	20*	9*
.45	308*	1,055*	0	0	520*	229	0	0
.50	429*	2,494*	0	0	616*	1,148*	12*	0
.55	124*	427*	0	0	3,282*	1,551*	329*	0
.60	21*	1,471*	0	0	1,330*	1,340*	800*	0
.65	260*	1,123*	9	0	35*	228*	868*	0
.70	66*	707*	3	0	2,092*	76*	933*	0
.80	10*	5,013*	0	0	1,062*	260*	-	0
.90	0	342*	-	0	142*	53*	-	0
.100	0	-	-	-	3*	35*	-	0
97.30	992*	2,157*	0	1*	96*	562*	2*	9*
.32	2,934*	96*	0	133*	1,005*	90*	0	510*
.35	1,755*	318*	0	197*	1,089*	49*	18*	544*
.40	989*	2,343*	0	24*	32*	0	85*	3*
.45	480*	1,922*	0	0	74*	0	9*	3*
.50	1,537*	2,981*	55	0	18*	3*	NS	0
.55	687*	55*	0	0	233*	18*	3*	0
.60	359*	245*	0	0	59*	48*	NS	0
.65	6*	465*	0	0	102*	141*	12*	0
.70	4*	313*	0	0	191*	6*	223*	0
.80	0	0	0	0	196*	184*	-	0
.90	0	17*	-	0	311*	30*	-	0
100.29	-	20*	0	1*	64*	409*	0	42*
.30	2,614*	151*	0	47*	58*	18*	0	152*
.35	769	98*	0	2*	131*	45*	0	0
.40	1,351	0	0	0	202*	143*	18*	0
.45	145*	0	0	0	310*	168*	0	0
.50	1,869*	0	0	0	50*	0	38*	0
.55	258*	86*	0	0	126*	0	115*	0
.60	259*	37*	0	0	25*	3*	18*	0
.65	32*	43*	0	0	18*	3*	2*	0
.70	0	0	0	0	0	0	3*	0
.80	39*	0	0	0	13*	0	0	3*
.90	0	3*	0	0	0	0	0	0
.100	0	0	-	-	36*	-	-	-
103.30	941*	408*	24	74*	261*	160*	0	8*
.35	562*	284*	0	6*	11*	0	0	0

Table 51. --Anchovy larvae--numbers by stations, 1963-64--Continued

Station	Cruise and month							
	6301-02 Jan.-Feb.	6304-05 Apr.-May	6307-08 July-Aug.	6310 Oct.	6401-02 Jan.-Feb.	6404 Apr.	6406-07 June-July	6410 Oct.
103.40	325*	10*	0	0	6*	59*	0	0
.45	375*	0	0	0	6*	0	NS	0
.50	167*	3*	0	3*	15*	0	0	0
.55	46*	0	0	0	12*	0	3*	0
.60	90*	0	0	0	41*	0	0	0
.65	0	0	0	0	28*	0	0	0
.70	0	0	0	0	39*	0	12*	0
.80	0	0	0	0	9*	0	9*	0
107.32	2,561*	225*	6	23*	10*	16*	6*	15*
.35	1,697*	17*	0	50*	7*	3*	0	3*
.40	3,672*	30*	0	23*	7*	3*	0	0
.45	709*	96*	0	17*	0	0	0	0
.50	641*	0	0	0	5*	0	0	0
.55	92*	0	0	0	3*	0	0	0
.60	95*	0	0	0	3*	0	0	0
.65	26*	0	0	0	12*	0	0	0
.70	0	0	0	0	6*	0	0	0
.80	3*	3*	0	0	6*	0	0	0
.90	0	0	0	3*	0	0	0	0
110.32	1,120*	0	0	3*	42*	63*	0	0
.35	829*	0	74	3*	209*	202*	0	0
.40	997*	2*	0	0	17*	33*	0	0
.45	76*	6*	0	0	11*	0	0	0
.50	753*	3*	0	0	34*	0	0	0
.55	331*	0	6	0	16*	0	3*	0
.60	528*	0	6	0	0	0	0	0
.65	163*	0	0	0	6*	0	0	0
.70	223*	0	0	0	12*	0	0	0
.80	84*	0	3	0	16*	0	0	0
.90	12*	10*	0	0	9*	0	0	0
.100	14*	0	-	-	0	-	-	-
113.30	6,286*	0	8	1*	226*	0	73*	26*
.35	1,285*	39*	0	0	28*	0	195*	10*
.40	2,263*	326*	0	0	56*	0	38*	0
.45	940*	26*	0	0	5*	6*	NS	0
.50	484*	132*	0	0	8*	0	0	0
.55	159*	429*	0	0	12*	0	0	0
.60	4,425*	214*	6	0	3*	0	0	0
.65	958*	31*	18	0	3*	0	NS	0
.70	592*	15*	6	0	0	0	0	0
.80	3*	0	0	0	0	0	0	0
.90	41*	0	0	-	11*	0	0	-
115.35	194*	6*	-	-	707*	-	0	-
117.26	793*	392*	60	0	1,353*	3*	466*	2*
.30	611*	326*	0	0	17*	36*	67*	8*
.35	251*	461*	9	0	70*	162*	3*	0
.40	271*	398*	0	0	282*	354*	9*	3*
.45	245*	55*	0	0	1,978*	192*	3*	0
.50	712*	36*	0	3*	14*	0	0	0
.55	144*	18*	0	0	15*	0	0	0
.60	1,950*	40*	0	0	81*	0	0	0
.65	719*	1,277*	0	0	26*	0	0	0
.70	239*	47*	0	0	0	0	0	0
.80	9*	0	3	0	0	0	0	0
.90	32*	0	3	-	0	0	3*	-
118.39	306*	456*	0	0	731*	656*	69*	3*
119.33	18*	345*	24	13*	111*	1,534*	3,300*	9*
120.25	714*	468*	397	30*	142*	8*	817*	0

Table 51. --Anchovy larvae--numbers by stations, 1963-64--Continued

Station	Cruise and month							
	6301-02 Jan.-Feb.	6304-05 Apr.-May	6307-08 July-Aug.	6310 Oct.	6401-02 Jan.-Feb.	6404 Apr.	6406-07 June-July	6410 Oct.
120.30	187*	1,430*	60	51*	2,466*	24*	329*	0
.35	121*	1,744*	89	41*	4,076*	195*	180*	6*
.40	867*	5*	59	30*	92*	122*	96*	2*
.45	86*	58*	3	3*	235*	302*	0	3*
.50	47*	8*	24	0	53*	104*	0	0
.55	67*	30*	27	0	11*	41*	0	0
.60	114*	77*	0	0	91*	7*	0	0
.65	329*	79*	0	0	256*	0	0	0
.70	92*	38*	3	0	3*	28*	0	0
.80	17*	17*	0	-	0	3*	0	-
.90	6*	0	-	-	0	-	0	-
123.37	102*	40*	0	2*	35*	96*	2*	0
.42	50*	3/ 3a*	0	0	74*	57*	172*	0
.45	3*	68*	0	0	292*	16*	75*	0
.50	6*	23*	0	0	24*	0	3*	0
.55	124*	3*	0	0	36*	10*	0	0
.60	567*	0	0	0	21*	16*	0	0
.65	588*	0	0	0	0	0	0	0
.70	79*	14*	0	0	0	0	0	0
.80	3*	0	0	-	0	0	0	-
127.34	289*	5*	0	16*	0	52*	39*	17*
.40	12*	9a*	0	0	3*	126*	0	0
.45	0	305*	0	0	86*	16*	0	0
.50	3*	235*	0	0	42*	0	0	0
.55	0	0	0	0	91*	0	0	0
.60	0	3*	0	0	0	0	0	0
.65	0	3*	0	0	0	3*	0	-
.70	0	23*	0	0	0	0	0	-
.80	6*	11*	0	-	0	-	0	-
130.30	6,326*	125*	363	22*	1,202*	3*	10*	55*
.35	3*	15*	0	3*	8,938*	0	0	81*
.40	171*	3*	0	11*	1,619*	0	0	0
.45	20*	0	0	0	91*	0	0	0
.50	0	3*	0	0	0	0	0	0
.55	0	3*	0	0	0	0	0	0
133.25	1,554*	73*	195*	8*	3,452*	6*	0	66*
.30	1,700*	0	9*	28*	2,554*	0	0	10*
.35	277*	0	35*	3*	403*	0	10*	3*
.40	60*	0	0	0	98*	0	15*	0
.45	0	0	0	0	95*	0	0	0
.50	0	0	0	0	5*	0	0	0
.55	0	318*	0	6*	0	0	0	0
.60	0	22*	0	0	0	0	0	0
.65	0	26*	0	-	16*	0	0	-
137.23	16,446*	694*	-	0	929*	228*	136*	0
.30	421*	3*	-	0	21*	0	0	0
.35	115*	3*	-	0	47*	37*	0	0
.40	0	0	-	0	0	3*	0	3*
.50	0	3*	0	0	0	0	11*	0
.55	0	3*	0	0	0	0	3*	0
.70	7*	0	0	-	0	0	0	-
.80	118*	0	0	-	0	-	0	-
140.30	8,597*	23*	-	-	288*	-	5*	-
.40	4*	0	-	-	2*	-	0	-
Total	121,794	77,547	4,499	1,998	80,658	61,083	20,515	4,261

1/ NS--sample spoiled or spilled.
2/ NQ--sample nonquantitative.
3/ "a"--first of two or more samples taken at station during cruise.

Table 52. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1951

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken
5101	1	4	11	434	3	233	8	442	10	317	-	-	33	1,430
5102	-	-	8	117	3	7	6	479	13	2,152	-	-	30	2,755
5103	-	-	4	41	3	72	14	1,711	14	6,088	4	96	39	8,008
5104	1	11	11	294	11	417	16	998	14	722	-	-	53	2,442
5105	0	0	8	64	7	329	15	717	13	660	-	-	43	1,770
5106	5	134	4	2,360	4	76	11	310	9	230	5	74	38	3,184
5107	10	112	6	322	0	0	3	43	8	211	-	-	27	688
5108	10	90	9	225	7	252	7	1,421	6	155	-	-	39	2,143
5109	7	56	5	236	3	10	7	295	3	20	2	41	27	658
5110	7	58	9	432	4	197	8	103	0	0	-	-	28	790
5111	5	17	9	1,944	6	586	4	1,201	3	153	-	-	27	3,901
5112	3	18	5	459	8	351	8	923	2	31	-	-	26	1,782
Total	49	500	89	6,928	59	2,530	107	8,643	95	10,739	11	211	410	29,551

Table 53. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1952

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-150		Total	
	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken	Occur-rences	Num-ber taken
5201	-	-	11	348	4	488	5	215	14	801	-	-	34	1,852
5202	-	-	9	420	6	341	17	3,247	10	1,345	2	42	44	5,395
5203	-	-	4	298	10	695	17	5,447	14	5,275	-	-	45	11,715
5204	-	-	9	665	11	722	16	441	23	6,797	-	-	59	8,625
5205	0	0	14	557	17	855	11	1,477	11	742	-	-	53	3,631
5206	0	0	21	1,863	12	201	13	5,874	17	6,123	-	-	63	14,061
5207	4	33	10	1,246	3	17	12	865	12	372	-	-	41	2,533
5208	4	104	5	141	7	378	24	2,691	2	248	-	-	42	3,562
5209	4	22	10	498	9	362	11	2,457	6	676	-	-	40	4,015
5210	0	0	7	187	6	128	9	2,075	3	20	-	-	25	2,410
5211	0	0	10	851	7	338	11	636	1	2	-	-	29	1,827
5212	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12	159	110	7,074	92	4,525	146	25,425	113	22,401	2	42	475	59,626

Table 54. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1953

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-150		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5301	-	-	16	500	9	463	8	11,077	8	780	0	0	41	12,820
5302	-	-	23	2,940	13	1,813	22	6,849	15	4,597	-	-	73	16,199
5303	-	-	24	2,694	7	912	24	2,641	19	9,595	-	-	74	15,842
5304	0	0	28	1,784	9	1,026	21	2,075	27	2,036	-	-	85	6,921
5305	0	0	23	966	7	192	17	1,758	23	579	-	-	70	3,495
5306	0	0	11	539	7	73	20	2,141	20	2,132	-	-	58	4,885
5307	1	3	14	4,616	8	349	10	382	12	289	-	-	45	5,639
5308	1	4	16	571	6	464	13	1,505	12	312	-	-	48	2,856
5309	-	-	13	1,306	-	-	20	1,703	-	-	-	-	33	3,009
5310	-	-	15	1,757	13	2,637	16	1,699	1	3	-	-	45	6,096
5311	-	-	18	7,470	-	-	-	-	-	-	-	-	18	7,470
5312	-	-	27	11,551	12	2,031	9	88	7	258	-	-	55	13,928
Total	2	7	228	36,694	91	9,960	180	31,918	144	20,581	0	0	645	99,160

Table 55. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1954

[Station lines given below each area]

Cruise	Northern and central California 50-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5401	2	562	33	7,451	16	4,398	19	1,677	13	10,742	3	29	86	24,859
5402	-	-	31	13,154	12	5,930	23	6,312	20	7,316	-	-	86	32,712
5403	1	11	28	16,538	12	921	30	6,982	22	9,857	-	-	93	34,309
5404	2	4	18	1,297	19	2,374	39	4,773	32	24,396	-	-	110	32,844
5405	-	-	22	2,114	16	2,170	15	1,635	38	6,574	-	-	91	12,493
5406	1	3	33	4,255	13	529	20	261	12	1,449	-	-	79	6,497
5407	4	1,627	30	5,347	7	482	7	96	13	1,010	-	-	61	8,562
5408	4	82	21	496	10	880	8	193	12	225	-	-	55	1,876
5409	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5410	1	17	20	374	10	705	14	145	1	6	-	-	46	1,247
5411	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5412	-	-	23	3,615	9	357	12	843	6	1,025	1	2	51	5,842
Total	15	2,306	259	54,641	124	18,746	187	22,917	169	62,600	4	31	758	161,241

Table 56. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1955

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5501	-	-	19	5,162	16	12,868	20	19,687	15	2,384	3	42	73	40,143
5502	-	-	22	3,822	13	5,060	24	20,303	14	1,766	0	0	73	30,951
5503	-	-	15	4,262	17	8,350	31	11,720	13	744	2	4	78	25,080
5504	-	-	19	1,750	19	2,024	37	12,498	13	218	-	-	88	16,490
5505	0	0	15	1,713	13	700	14	1,186	10	600	-	-	52	4,199
5506	2	10	26	6,743	16	576	12	1,262	10	4,064	-	-	66	12,655
5507	2	12	28	4,461	13	352	13	928	8	1,304	-	-	64	7,057
5508[1/]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5509	-	-	22	720	-	-	-	-	-	-	-	-	22	720
5510	3	16	10	148	8	137	12	314	5	32	-	-	38	647
5511	-	-	26	1,155	-	-	-	-	-	-	-	-	26	1,155
5512	-	-	14	211	3	25	12	670	5	157	2	23	36	1,086
Total	7	38	216	30,147	118	30,092	175	68,568	93	11,269	7	69	616	140,183

1/ Norpac cruise not included

Table 57. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1956

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5601	-	-	12	770	9	363	14	462	11	1,146	4	6,103	50	8,844
5602	-	-	12	366	8	74	19	9,596	16	5,949	11	13,154	66	29,139
5603	-	-	22	1,691	19	2,093	29	7,470	22	5,386	-	-	92	16,640
5604	0	0	16	2,262	11	3,011	17	10,236	14	1,053	8	6,295	66	22,857
5605	0	0	20	2,475	15	842	19	5,814	12	2,807	-	-	66	11,938
5606	1	2	18	3,803	11	571	10	12,401	12	1,483	-	-	52	18,260
5607	4	627	27	3,957	8	1,498	13	7,280	9	1,358	-	-	61	14,720
5608	-	-	-	-	-	-	19	8,001	8	1,634	-	-	27	9,635
5609	-	-	-	-	-	-	11	305	3	68	-	-	14	373
5610	-	-	18	825	0	0	-	-	-	-	-	-	18	825
5611	-	-	12	1,423	0	0	-	-	-	-	-	-	12	1,423
5612	-	-	11	266	1	11	-	-	-	-	-	-	12	277
Total	5	629	168	17,838	82	8,463	151	61,565	107	20,884	23	25,552	536	134,931

Table 58. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1957

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5701	-	-	-	-	4	604	17	6,581	11	3,314	-	-	32	10,499
5702	-	-	23	23,280	17	3,486	17	9,279	22	12,202	3	13	82	48,260
5703	-	-	23	6,723	9	1,052	19	4,725	17	1,750	5	79	73	14,329
5704	-	-	25	16,879	21	2,237	13	734	12	364	3	18	74	20,232
5705	3	14	21	15,203	12	2,090	30	2,906	11	582	-	-	77	20,795
5706	7	122	33	11,098	8	103	31	5,107	10	1,973	1	4	90	18,407
5707	5	23	24	3,834	9	493	17	1,735	12	2,801	-	-	67	8,886
5708	-	-	-	-	-	-	17	1,440	2	6	-	-	19	1,446
5709	-	-	-	-	-	-	7	35	0	0	-	-	7	35
5710	-	-	13	311	8	487	4	41	1	22	-	-	26	861
5711	2	47	19	2,153	5	173	-	-	-	-	-	-	26	2,373
5712	-	-	6	442	1	66	0	0	-	-	-	-	7	508
Total	17	206	187	79,923	94	10,791	172	32,583	98	23,014	12	114	580	146,631

Table 59. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1958

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5801	7	2,754	21	5,291	19	2,666	18	8,085	12	11,180	3	28	80	30,004
5802	-	-	28	15,027	18	2,792	22	20,468	19	11,848	3	32	90	50,167
5803	9	1,351	34	11,881	18	9,028	27	15,141	18	8,718	4	765	110	46,884
5804	21	712	43	15,433	30	11,175	32	6,814	14	754	-	-	140	34,888
5805	16	397	47	15,855	23	5,844	14	884	6	97	-	-	106	23,077
5806	12	957	31	6,332	11	411	12	62	5	321	-	-	71	8,083
5807	31	1,928	35	7,590	16	627	7	58	3	19	-	-	92	10,222
5808	-	-	-	-	-	-	12	258	5	52	-	-	17	310
5809	-	-	6	100	-	-	10	789	1	3	-	-	17	892
5810	5	33	8	199	7	35	10	243	2	10	1	10	33	530
5811	-	-	12	74	2	4	-	-	-	-	-	-	14	78
5812	-	-	7	592	1	6	-	-	-	-	-	-	8	598
Total	101	8,132	272	78,374	145	32,588	164	52,802	85	33,002	11	835	778	205,733

Table 60. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1959

[Station lines given below each area]

Cruise	Northern and central California 43-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
5901	11	446	27	6,612	7	109	19	1,670	13	4,938	5	50	82	13,825
5902	10	6,548	32	29,580	11	160	29	2,933	22	4,102	-	-	104	43,323
5903	-	-	21	9,990	16	492	29	4,016	18	4,294	-	-	84	18,792
5904	31	9,931	50	36,176	15	6,784	32	37,864	9	461	4	84	141	91,300
5905	32	3,077	48	7,749	21	3,793	22	1,548	13	1,306	-	-	136	17,473
5906	7	665	48	7,766	21	2,407	19	743	15	2,151	-	-	110	13,732
5907	37	1,822	33	2,240	15	832	11	177	12	1,348	-	-	108	6,419
5908	1	9	17	165	7	182	9	95	8	88	2	3	44	542
5909	-	-	5	47	-	-	19	238	6	23	-	-	30	308
5910	0	0	6	65	3	9	8	36	4	55	-	-	21	165
5911	0	0	8	162	-	-	-	-	-	-	-	-	8	162
5912	3	39	16	673	-	-	-	-	-	-	-	-	19	712
Total	132	22,537	311	101,225	116	14,768	197	49,320	120	18,766	11	137	887	206,753

Table 61. --Anchovy larvae--occurrence and abundance by monthly cruise and area, 1960

[Station lines given below each area]

Cruise	Northern and central California 40-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140-157		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
6001	8	77	29	1,233	19	2,407	28	5,955	28	24,940	18	3,325	130	37,937
6002	1	5	21	3,642	26	13,757	31	9,855	30	21,612	-	-	109	48,871
6003	4	731	36	19,401	27	20,049	37	41,078	29	17,434	-	-	133	98,693
6004	17	867	56	26,149	40	15,545	48	22,960	30	2,078	7	102	198	67,701
6005	2	37	39	13,231	24	4,865	30	1,923	20	1,884	-	-	115	21,940
6006	7	617	44	4,050	25	1,063	15	1,718	14	2,197	-	-	105	9,645
6007	7	156	27	1,267	19	408	22	510	11	1,233	-	-	86	3,574
6008	-	-	12	244	9	223	9	341	8	76	1	1	39	885
6009	-	-	-	-	0	0	13	171	-	-	-	-	13	171
6010	1	3	15	141	2	6	17	250	2	43	-	-	37	443
6011	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6012	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	47	2,493	279	69,358	191	58,323	250	84,761	172	71,497	26	3,428	965	289,860

Table 62. --Anchovy larvae--occurrence and abundance by cruise and area, 1961

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
6101-02	4	17	12	253	20	1,545	29	8,103	24	36,592	-	-	89	46,510
6104-05	4	57	50	12,255	43	6,834	44	15,156	27	4,351	-	-	168	38,653
6107	13	1,872	33	8,781	12	483	11	216	9	97	-	--	78	11,449
6110-11	9	93	20	146	9	66	16	114	9	69	1	3	64	491
Total	30	2,039	115	21,435	84	8,928	100	23,589	69	41,109	1	3	399	97,103

Table 63. --Anchovy larvae--occurrence and abundance by cruise and area, 1962

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
6201-02	5	133	28	8,434	28	8,606	33	12,304	34	38,753	4	1,246	132	69,476
6203-04	11	1,921	47	48,709	38	25,642	39	51,406	43	5,719	5	376	183	133,773
6207-08	-	-	35	5,106	13	182	19	1,843	9	405	-	-	76	7,536
6210-11	10	77	20	561	11	164	14	480	6	600	2	8	63	1,890
Total	26	2,131	130	62,810	90	34,594	105	66,033	92	45,477	11	1,630	454	212,675

Table 64. --Anchovy larvae--occurrence and abundance by cruise and area, 1963

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
6301-02	4	16	44	23,339	35	29,081	50	31,707	26	29,050	2	8,601	161	121,794
6304-05	20	3,765	52	50,250	27	12,426	36	9,044	28	2,039	1	23	164	77,547
6307-08	-	-	29	2,924	3	85	21	888	4	602	-	-	57	4,499
6310	-	-	22	1,117	15	604	10	178	9	99	-	-	56	1,998
Total	24	3,781	147	77,630	80	42,196	117	41,817	67	31,790	3	8,624	438	205,838

Table 65. --Anchovy larvae--occurrence and abundance by cruise and area, 1964

[Station lines given below each area]

Cruise	Central California 60-77		Southern California 80-93		Northern Baja California 97-107		Upper central Baja California 110-120		Lower central Baja California 123-137		Southern Baja California 140		Total	
	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken	Occurrences	Number taken
6401-02	14	3,793	44	37,941	42	4,926	41	13,534	24	20,174	2	290	167	80,658
6404	18	10,877	46	43,301	22	2,161	21	4,075	14	669	-	-	121	61,083
6406-07	14	1,863	40	11,944	17	576	16	5,651	11	476	1	5	99	20,515
6410	-	-	20	2,662	11	1,292	10	72	7	235	-	-	48	4,261
Total	46	16,533	150	95,848	92	8,955	88	23,332	56	21,554	3	295	435	166,517

Table 66. --Numbers of stations occupied on CalCOFI surveys, summarized by cruise and area, 1951-64

[Station lines given below each area]

Year and Cruise	Station lines occupied	Northern California 40-57	Central California 60-77	Southern California 80-93	Northern Baja California 97-107	Upper central Baja California 110-120	Lower central Baja California 123-137	Southern Baja California 140-157	Total
1951									
5101	60-137	0	15	33	28	28	20	0	124
5102	80-137	0	0	31	21	26	20	0	98
5103	80-157	0	0	32	27	28	20	30	137
5104	60-137	0	22	39	29	28	20	0	138
5105	60-137	0	21	29	29	28	20	0	127
5106	60-157	0	26	36	25	28	21	34	170
5107	40-137	23	24	23	14	9	16	0	109
5108	40-137	22	20	29	18	19	20	0	128
5109	60-157	0	41	22	18	17	13	25	136
5110	60-137	0	40	24	18	18	16	0	116
5111	60-137	0	20	22	16	18	13	0	89
5112	63-123	0	14	17	15	16	2	0	64
Total		45	243	337	258	263	201	89	1,436
1952									
5201	80-137	0	0	28	19	22	25	0	94
5202	80-150	0	0	27	20	30	17	14	108
5203 1/	80-137	0	0	25	20	25	21	0	91
5204	60-137	0	18	37	31	36	33	0	155
5205	60-137	0	23	50	43	40	31	0	187
5206	50-137	7	27	45	45	42	30	0	196
5207	40-137	22	24	38	32	36	27	0	179
5208	60-137	0	15	22	17	24	15	0	93
5209	60-137	0	21	22	17	19	15	0	94
5210	60-137	0	18	21	15	19	15	0	88
5211	60-137	0	18	22	16	21	14	0	91
Total		29	164	337	275	314	243	14	1,376
1953									
5301	80-150	0	0	34	20	16	13	13	96
5302	80-137	0	0	35	17	24	18	0	94
5303 1/	80-137	0	0	35	17	29	31	0	112
5304	60-137	0	20	61	41	38	35	0	195
5305	60-137	0	30	63	38	37	35	0	203
5306	60-137	0	26	56	43	40	31	0	196
5307	60-137	0	24	38	20	20	19	0	121
5308	60-137	0	19	38	20	21	20	0	118
5309	83-87, 113-120	0	0	18	0	23	0	0	41
5310	83-137	0	0	18	16	21	14	0	69
5311	83-87	0	0	19	0	0	0	0	19
5312	83-137	0	0	28	17	21	16	0	82
Total		0	119	443	249	290	232	13	1,346

See footnote at end of table.

Table 66. --Numbers of stations occupied on CalCOFI surveys, summarized by cruise and area, 1951-64--Continued

[Station lines given below each area]

Year and Cruise	Station lines occupied	Northern California 40-57	Central California 60-77	Southern California 80-93	Northern Baja California 97-107	Upper central Baja California 110-120	Lower central Baja California 123-137	Southern Baja California 140-157	Total
1954									
5401	77-150	0	2	42	22	27	23	18	134
5402	77-137	0	2	37	24	31	22	0	116
5403	77-137	0	2	36	31	48	36	0	153
5404	60-137	0	18	51	39	50	38	0	196
5405	60-137	0	19	54	42	52	38	0	205
5406	50-137	13	23	48	39	51	35	0	209
5407	60-137	0	19	37	20	22	20	0	118
5408	60-137	0	22	39	19	22	20	0	122
5410	77-137	0	2	38	22	23	20	0	105
5412	80-157	0	0	36	16	26	19	18	115
Total		13	109	418	274	352	271	36	1,473
1955									
5501	80-157	0	0	24	21	29	21	17	112
5502	80-157	0	0	22	21	36	20	18	117
5503	80-157	0	0	27	26	37	27	25	142
5504	80-137	0	0	35	34	39	26	0	134
5505	63-137	0	16	45	54	46	23	0	184
5506	60-137	0	28	49	40	47	25	0	189
5507	63-137	0	23	48	54	46	25	0	196
5508 [2]	Norpac	7	9	12	6	9	4	7	54
5509	83-90	0	0	[3]43	0	0	0	0	43
5510	60-137	0	19	29	17	24	17	0	106
5511	83-90	0	0	[3]43	0	0	0	0	43
5512	80-150	0	0	26	21	28	18	12	105
Total		7	95	403	294	341	206	79	1,425
1956									
5601	80-157	0	0	26	21	29	17	18	111
5602	80-157	0	0	28	23	30	18	31	130
5603	80-137	0	0	37	32	38	27	0	134
5604	60-157	0	27	39	32	33	20	27	178
5605	40-137	27	26	56	59	47	24	0	239
5606	40-137	27	25	49	36	47	25	0	209
5607	60-137	0	34	55	50	40	23	0	202
5608	110-137	0	0	0	0	22	14	0	36
5609	110-137	0	0	0	0	22	14	0	36
5610	80-97	0	0	35	7	0	0	0	42
5611	80-97	0	0	33	7	0	0	0	40
5612	80-97	0	0	35	7	0	0	0	42
Total		54	112	393	274	308	182	76	1,399

See footnotes at end of table.

Table 66. --Numbers of stations occupied on CalCOFI surveys, summarized by cruise and area, 1951-64--Continued

[Station lines given below each area]

Year and Cruise	Station lines occupied	Northern California 40-57	Central California 60-77	Southern California 80-93	Northern Baja California 97-107	Upper central Baja California 110-120	Lower central Baja California 123-137	Southern Baja California 140-157	Total
1957									
5701	100-137	0	0	0	12	25	20	0	57
5702	80-157	0	0	35	27	31	25	24	142
5703	80-150	0	0	34	19	28	26	17	124
5704	80-157	0	0	41	38	39	43	46	207
5705	60-137	0	32	54	52	50	17	0	205
5706	60-157	0	36	57	51	56	30	23	253
5707	60-137	0	26	54	45	50	42	0	217
5708	110-137 (157)	0	0	0	0	23	14	4	41
5709	110-137	0	0	0	0	23	14	0	37
5710	80-137	0	0	41	32	34	36	0	143
5711	70-97	0	7	30	7	0	0	0	44
5712	80-90 (110)	0	0	18	4	1	0	0	23
Total		0	101	364	287	360	267	114	1,493
1958									
5801	60-157	0	12	27	27	29	26	29	150
5802	80-150	0	0	30	28	32	25	16	131
5803	70-150	0	10	41	31	36	25	16	159
5804	47-137	2	48	61	57	56	43	0	267
5805	60-137	0	36	57	53	56	30	0	232
5806	50-137	10	35	57	40	45	25	0	212
5807	40-137	29	48	59	53	48	35	0	272
5808	110-137	0	0	0	0	23	14	0	37
5809	90-93, 110-137	0	0	3/ 19	0	22	13	0	54
5810	60-153	0	40	45	39	44	38	44	250
5811	80-100	0	0	30	12	0	0	0	42
5812	80-100	0	0	33	12	0	0	0	45
Total		41	229	459	352	391	274	105	1,851
1959									
5901	60-157	0	29	45	40	43	39	58	254
5902	73-137	0	12	46	37	44	33	0	172
5903	83-137	0	0	28	34	46	32	0	140
5904	60-147	0	34	59	52	55	26	24	250
5905	60-157	0	48	70	54	55	34	0	261
5906	77-137	0	8	58	54	56	38	0	214
5907	50-137	3	54	58	52	55	48	0	270
5908	77-155	0	3	57	54	48	39	37	238
5909	90-93, 110-137	0	0	33	0	27	15	0	75
5910	43-137	19	36	44	42	44	41	0	226
5911	77-93	0	4	35	0	0	0	0	39
5912	77-93	0	4	39	0	0	0	0	43
Total		22	232	572	419	473	345	119	2,182

See footnote at end of table.

Table 66. --Numbers of stations occupied on CalCOFI surveys, summarized by cruise and area, 1951-64--Continued

[Station lines given below each area]

Year and Cruise	Station lines occupied	Northern California 40-57	Central California 60-77	Southern California 80-93	Northern Baja California 97-107	Upper central Baja California 110-120	Lower central Baja California 123-137	Southern Baja California 140-157	Total
1960									
6001	40-157	27	44	50	41	44	42	58	306
6002	73-137	0	12	46	40	42	32	0	172
6003	73-137	0	8	42	39	42	32	0	163
6004	40-157	33	34	65	53	56	48	53	342
6005	73-137	0	5	42	30	48	28	0	153
6006	73-137	0	8	59	48	48	28	0	191
6007	50-137	2	21	57	43	51	37	0	211
6008	83-143	0	0	27	14	17	12	2	72
6009	103-120	0	0	0	6	22	0	0	28
6010	60-137	0	33	50	25	37	27	0	172
Total		62	165	438	339	407	286	113	1,810
1961									
6101-02	60-137	0	32	57	42	51	41	0	223
6104-05	60-137	0	32	59	47	51	51	0	240
6107	60-137	0	32	56	47	52	51	0	238
6110-11	60-140	0	32	59	47	52	48	5	243
Total		0	128	231	183	206	191	5	944
1962									
6201-02	60-140	0	28	59	47	53	51	5	243
6203-04	60-140	0	31	58	47	55	51	5	247
6207-08	80-130	0	0	67	45	49	29	0	190
6210-11	60-140	0	26	58	46	53	51	5	239
Total		0	85	242	185	210	182	15	919
1963									
6301-02	60-140	0	31	83	50	53	51	5	273
6304-05	60-140	0	31	58	47	53	51	5	245
6307-08	80-137	0	0	48	44	47	45	0	184
6310	80-137	0	0	49	45	44	41	0	179
Total		0	62	238	186	197	188	10	881
1964									
6401-02	60-140	0	28	58	51	53	51	5	246
6404	60-137	0	35	50	46	47	46	0	224
6406-07	60-140	0	34	56	40	47	48	5	230
6410	80-137	0	0	51	45	44	37	0	177
Total		0	97	215	182	191	182	10	877

1/ Cruise in "late" March, made off central Baja California, not included.
2/ Norpac cruise included.
3/ First occupancy listed.

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